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Indian Standard

SPECIFICATION FOR AUTOMOBILE LAMPS

(Second Revision)

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

Gr 8 *May* 1980

Indian Standard

SPECIFICATION FOR AUTOMOBILE LAMPS

(Second Revision)

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(*Continued on page* 38)

Indian Standard
SPECIFICATION FOR AUTOMOBILE LAMPS
(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 30 May 1979, after the draft finalized by the Electric Lamps and Accessories Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard was first published in 1960 under the title ' Schedule for automobile lamps ' with a view to rationalize the various types and ratings of lamps; it covered the voltage, wattage and dimensional details that were, by and large, expected to meet the demands of the automobile industry at that time. The revision of this standard was first undertaken in 1966 with a view to effecting further reduction of types and the scope was enlarged to cover the methods of measurement and requirements for electrical and photometric characteristics. This revision has been prepared with a view to including the lamps suitable for new types of automobile headlights such as Anglo-American headlight and improved version of the European Beam with short cut-off asymmetric and symmetric. Additional details regarding the filament position with respect to the axis of the lamps axial error and its determination are also being included. In order to the quality, the qualifying limit for the compliance of the various tests has also been modified. Care has also been taken to specify different caps to avoid interchangeability of lamps of the two beam patterns.

0.3 This standard covers five groups of automobile lamps operating on 6, 12 and 24 V: Group I covering automobile lamps such as side, tail dashboard and some interior lighting lamps; Group II covering other types of interior lighting, stop-tail and direction flasher lamps, which are bigger than Group I in size; Group III covering head light lamps wherein the luminous intensity, focussing, etc, are important to give required beam pattern; Group IV covering festoon lamps; and Group V covering lamps used for fog and back-up lights.

0.4 Each lamp type has been given a reference number, indicating the group, the rated voltage and the serial number in that group which, in turn when referred in the corresponding table, would give the details of electrical and dimensional characteristics, cap used, etc, of that lamp. This will also enable the identification of the lamp by means of the simple reference number.

0.5 The classification of these lamps as automobile miniature lamps (M), medium (D), head light (H) and festoon (F), is meant to apply, for the purpose of this standard, only to those lamps used in automobile vehicles.

0.6 The requirements of assemblers of motor cars, trucks, motor cycles and scooters as well as the requirements of users of such vehicles have been taken into consideration while preparing this standard. Requirements for lamps used in mopeds, scooters, motor cycles, tractors and three wheelers could not be included due to the lack of data. It is intended to collect the data for these types of lamps and include them in the standard at a later stage.

0.7 In view of the wide variation in type and application of the automobile lamps no standard method for vibration test could be included in the standard. The test procedure and requirements for carrying out vibration test has, therefore, been kept as subject to agreement between the purchaser and the supplier. This subject is being actively studied and it is hoped that at a later stage it would be possible to include a suitable test method also in the standard.

0.8 In the preparation of this standard assistance has been derived from the following:

IEC Pub 61-1 (1969) Lamp caps and holders together with gauges for the control of interchangeability and safety, Part 1 Lamps caps. International Electrotechnical Commission.

DIN 72601 Auto-glow Lamps. Deutscher Normenausschuss.

BS : 941-1970 Specification for filament lamps for road vehicles. British Standards Institution.

0.9 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

---

*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard specifies the technical requirements and methods of tests for automobile lamps used for various purposes in an automobile, such as for headlights, interior lighting, side lighting, dashboard lighting.

1.1.1 This standard covers filament lamps of nominal voltages of 6, 12 and 24 V and for use in private and commercial vehicles.

1.1.2 The lamps covered by this standard are suitable for the system of traffic keeping to the left of the road.

2. TERMINOLOGY

2.0 For the purpose of this standard, the definitions given in IS : 1885 (Part XVI/Sec 3)-1967* and the following shall apply.

2.1 Type — Denotes lamps of the same general construction, which are intended to be identical in photometric and electrical ratings.

2.2 Batch — Denotes all the lamps of one type put forward in a lot at one time for acceptance or all the lamps of one type which are subjected on one occasion to tests for compliance with this standard.

2.3 Test Quantities

2.3.1 *Inspection Test Quantity* (*ITQ*) — The number of lamps selected from a batch according to an agreed method, the test on which shall determine whether or not the batch complies with the mechanical and physical requirements specified in **4.1** and marking requirements specified in **5**.

2.3.2 *Rating Test Quantity* (*RTQ*) — The number of lamps selected from a batch according to an agreed method, the initial rating test on which shall determine whether or not the batch complies with the initial rating requirements specified in **4.2**.

2.3.3 *Life Test Quantity* (*LTQ*) — The number of lamps selected from a batch according to an agreed method, the life test and measurements for individual lumens at 50 percent of specified life hours on which shall determine whether or not the batch complies with the life performance requirements specified in **4.3**.

2.4 Light Centre — The geometrical centre of the filament.

---

*Electrotechnical vocabulary : Part XVI Lighting, Section 3 Lamps and auxiliary apparatus.

2.5 Light Centre-Length — The distance from the light centre to a specified position on the lamp cap or base as shown in the appropriate tables.

2.6 Lumen — The unit of luminous flux. It is equal to the flux emitted in a solid angle of one steradian by a uniform point source having an intensity of one candela.

NOTE — The candela (abbreviation : cd) is the unit of luminous intensity. It is of a magnitude such that the luminance of a full radiator at the temperature of solidification of platinum is 60 units of luminous intensity per square centimetre.

2.7 Axial Displacements — The perpendicular distance of the light centre from the axis of the cap.

2.8 Initial Readings — The photometric and electrical measurements made at the end of the ageing period.

2.9 Life of a Lamp — The number of hours a lamp operates to burn-out or to any other criterion of life performance under the conditions laid down in this standard.

2.9.1 *Average Life* — The arithmetical mean of lives of the lamps of the life test quantity (LTQ).

2.10 Rated Voltage — The voltage marked on the lamp.

2.11 Rated Wattage — The wattage marked on the lamp.

2.12 Lumen Maintenance — The ratio of the lumens of an individual lamp at the specified time of measurement in the life test, to that measured in the rating test.

3. CHARACTERISTICS OF LAMPS

3.1 The various particulars of automobile lamps covered by the following five groups are given in Tables 1 to 10 :

Group I	Automobile lamps such as side, tail dashboard and some interior lighting lamps (*see* Tables 1 and 6)
Group II	Other types of interior lighting, stop-tail and direction flasher lamps which are bigger than Group I in size (*see* Tables 2 and 7)
Group III	Lamps for headlights wherein the luminous intensity, focussing, etc, are important to give required beam pattern (*see* Tables 3A, 3B and 3C, 8A, 8B and 8C)
Group IV	Festoon lamps (*see* Tables 4 and 9)
Group V	Lamps used for fog and back-up lights (*see* Tables 5 and 10).

3.1.1 *Typical Shapes of Lamps* — For easy identification, the typical shapes of various types of lamps are given in Tables 1 to 4.

3.1.2 *Cap Designation* — The abbreviations used in Tables 1 to 5 stand for the following:

BA	Bayonet automobile
BAY	Bayonet automobile offset pins
SV	Festoon
E	Edison screw
P	Prefocus
d	Double contact
s	Single contact
t	Treble contact

3.1.2.1 The figures in the cap or collar designation refer to the nominal outer diameter in millimetres.

4. REQUIREMENTS

4.1 Mechanical and Physical Requirements

4.1.1 *Dimensional Requirements of the Lamps* — The dimensions of the various lamps shall be in accordance with those specified in the relevant tables (*see* Tables 1 to 5).

4.1.2 *Bulbs* — The bulbs shall be clear, uncoloured unless specified otherwise, and free from defects determinental to service.

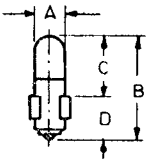
4.1.3 *Caps* — Dimensions of caps shall be in accordance with those specified in Appendix A.

4.1.4 *Attachment of Caps to Glass Shells* — The caps shall be attached to the glass shells so strongly as to withstand torsion test carried out in accordance with **7.2.1** with the following torsional moments both during the inspection test and at the end of the life test:

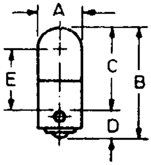
Types of Cap	*Torsional Moment* Nm
BA 7	Under consideration
BA 9	0·23
E 10	
BA 15	1·15
BAY 15	
P 36/21 × 22	
BA 20	1·15
P 45t	

TABLE 1 MINIATURE AUTOMOBILE LAMPS (SIDE, TAIL AND DASH-BOARD LAMPS)

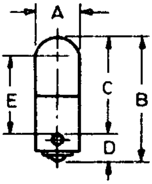
(*Clauses* 3.1 *and* 4.1.1)



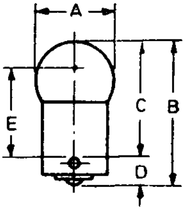
M_1



M_2



M_3



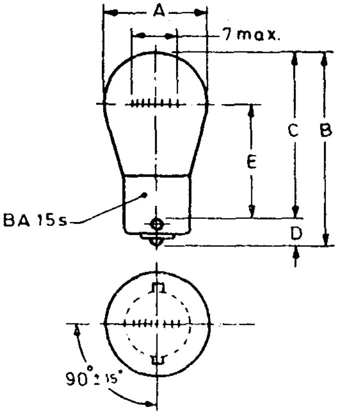
M_4

Ref No.	Volt	Watt	Diameter, *Max* *A*	Overall Length, *Max* *B*	Pin to Crown, *Max* *C*	Length Pin to Solder, *Max* *D*	Light Centre Length *E*	Cap	Ref to Fig.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
M 6/1	6	0·6	6·8	20·7	12	8·7	—	BA 7S	M_1
M 6/2	6	1·2	6·8	20·7	12	8·7	—	BA 7S	M_1
M 6/3	6	2·0	8·8	23·9	18	5·9	—	BA 9S	M_2
M 6/4	6	4·0	8·8	27·4	21·5	5·9	15±1·5	BA 9S	M_3
M 6/5	6	5·0	19·0	37·5	30	7·5	19±1·5	BA 15S	M_4
M 6/6	6	10·0	19·0	37·5	30	7·5	19±1·5	BA 15S	M_4
M 12/1	12	1·2	6·8	20·7	12	8·7	—	BA 7S	M_1
M 12/2	12	2·0	6·8	20·7	12	8·7	—	BA 7S	M_1
M 12/3	12	2·0	8·8	23·9	18	5·9	—	BA 9S	M_2
M 12/4	12	4·0	8·8	27·4	21·5	5·9	15±1·5	BA 9S	M_2
M 12/5	12	5·0	19·0	37·5	30	7·5	19±1·5	BA15S	M_3
M 12/6	12	10·0	19·0	37·5	30	7·5	19±1·5	BA15S	M_4
M 24/1	24	2·0	8·8	23·9	18	5·9	—	BA 9S	M_2
M 24/2	24	4·0	8·8	27·4	21·5	5·9	15±1·5	BA 9S	M_3
M 24/3	24	5·0	19·0	37·5	30	7·5	19±1·5	BA15S	M_4
M 24/4	24	10·0	19·0	37·5	30	7·5	19±1·5	BA15S	M_4

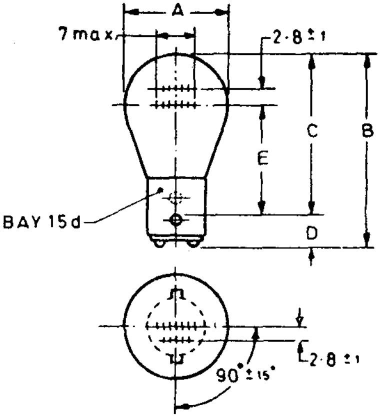
NOTE — LCL is recommendatory and not mandatory.

TABLE 2 MEDIUM LAMPS (INTERIOR, STOP-AND-TAIL AND FLASHER LAMPS)

(*Clauses* 3.1 *and* 4.1.1)



D$_1$



D$_2$

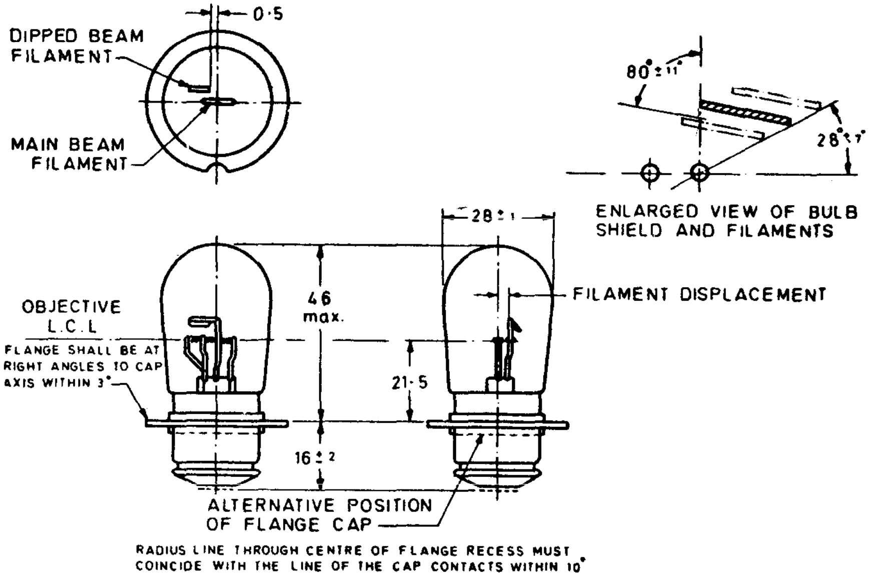
Ref No.	Volt	Watt	Diameter, *Max* *A*	Overall Length, *Max* *B*	Distance Between Pin to Crown, *Max* *C*	Length Pin to Solder *D*	Light Centre Length *E*	Cap	Ref to Fig.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
D 6/1	6	21	26·5	52·5	45	7·0 ± 0·5	31·8 ± 1	BA 15S	D$_1$
D 6/2	6	5/21	26·5	52·5	45	7·0 ± 0·5	31·8 ± 1	BAY 15d	D$_1$
D 6/3	6	3/15	26·5	52·5	45	7·0 ± 0·5	31·8 ± 1	BAY 15d	D$_2$
D 12/1	12	21	26·5	52·5	45	7·0 ± 0·5	31·8 ± 1	BA 15S	D$_1$
D 12/2	12	5/21	26·5	52·5	45	7·0 ± 0·5	31·8 ± 1	BAY 15d	D$_2$
D 24/1	24	21	26·5	52·5	45	7·0 ± 0·5	31·8 ± 1	BA 15S	D$_1$
D 24/2	24	5/21	26·5	52·5	45	7·0 ± 0·5	31·8 ± 1	BAY 15d	D$_2$

BA 15d/19 with same measurements may also be used.

NOTE — LCL is recommendatory and not mandatory.

TABLE 3A HEAD LIGHT LAMPS (ANGLO AMERICAN BEAM PATTERN)

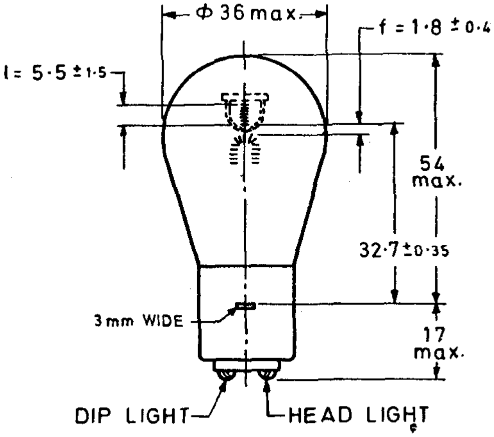
(*Clauses* 3.1 *and* 4.1.1)

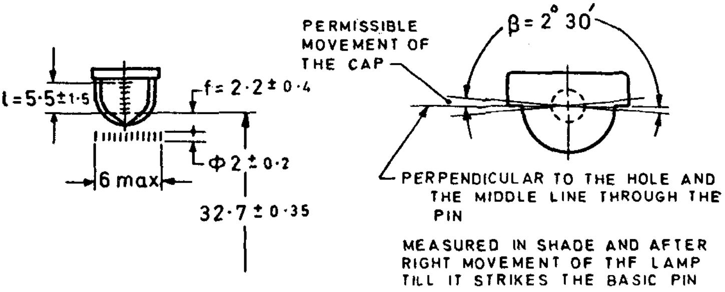

0·5
DIPPED BEAM FILAMENT
MAIN BEAM FILAMENT
80° ± 1°
28° ± 1°
ENLARGED VIEW OF BULB SHIELD AND FILAMENTS
28 ± 1
FILAMENT DISPLACEMENT
46 max.
OBJECTIVE L.C.L
FLANGE SHALL BE AT RIGHT ANGLES TO CAP AXIS WITHIN 3°
21·5
16 ± 2
ALTERNATIVE POSITION OF FLANGE CAP
RADIUS LINE THROUGH CENTRE OF FLANGE RECESS MUST COINCIDE WITH THE LINE OF THE CAP CONTACTS WITHIN 10°

REF No.	VOLT	WATT	DIAMETER, *Max*	OVERALL LENGTH, *Max*	LENGTH FLANGE TO SOLDER, *Max*	LIGHT CENTRE LENGTH	CAP
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HA 6/1	6	30/24	29	64	16 ± 2	21·5 ± 0·5	P36
HA 12/1	12	50/40	29	64	16 ± 2	21·5 ± 0·5	P36
HA 24/1	24	54/44	29	64	16 ± 2	21·8 ± 0·5	P36

TABLE 3B HEAD LIGHT LAMPS (EUROPEAN SYMMETRIC BEAM PATTERN)

(*Clauses* 3.1 *and* 4.1.1)

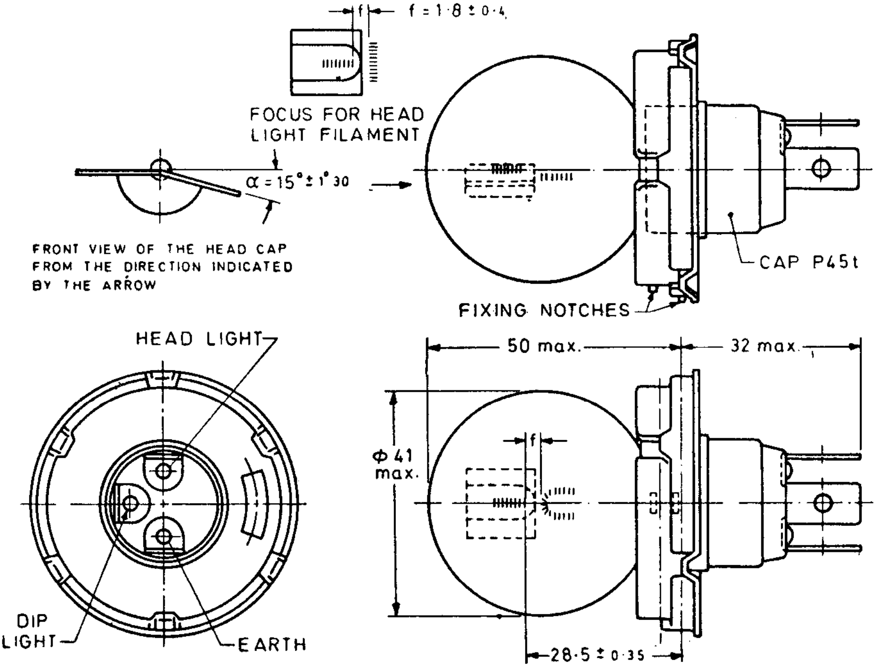



l = 5·5 ± 1·5
f = 2·2 ± 0·4
Φ 2 ± 0·2
6 max
32·7 ± 0·35
PERMISSIBLE MOVEMENT OF THE CAP
β = 2° 30′
PERPENDICULAR TO THE HOLE AND THE MIDDLE LINE THROUGH THE PIN
MEASURED IN SHADE AND AFTER RIGHT MOVEMENT OF THE LAMP TILL IT STRIKES THE BASIC PIN

REF NO.	VOLT	WATT	DIAMETER, *Max*	OVERALL LENGTH, *Max*	LENGTH PIN TO SOLDER, *Max*	LIGHT CENTRE LENGTH	CAP
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HB 6/1	6	15/25	36	71	17·0	32·7±0·35	BA 20d
HB 6/2	6	25/25	36	71	17·0	32·7±0·35	BA 20d
HB 12/1	12	50/40	36	71	17·0	32·7±0·35	BA 20d
HB 12/2	12	35/35	36	71	17·0	32·7±0·35	BA 20d
HB 24/1	24	55/50	36	71	17·0	32·7±0·35	BA 20d

TABLE 3C HEAD LIGHT LAMPS (EUROPEAN ASYMMETRIC BEAM PATTERN)

(*Clauses* 3.1 *and* 4.1.1)

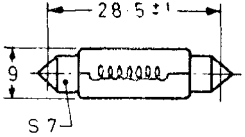


Ref No.	Volt	Watt	Diameter, *Max*	Over-all Length, *Max*	Length Flange to Lug, *Max*	Light Centre Length	Cap
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HC 6/1	6	45/40	41	82	32	28·5 ± 0·35	P 45t
HC 12/1	12	45/40	41	82	32	28·5 ± 0·35	P 45t
HC 24/1	24	55/50	41	82	32	28·5 ± 0·35	P 45t

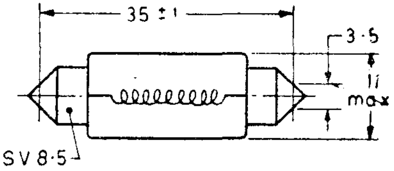
Note — 35 mm oblong shape is also allowed.

TABLE 4 FESTOON LAMPS

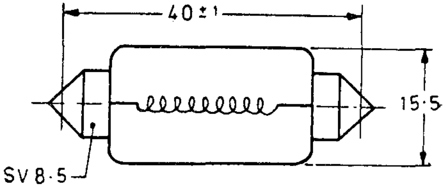
(*Clauses* 3.1 *and* 4.1.1)



F$_1$



F$_2$



F$_3$

REF NO.	VOLTS	WATT	DIAMETER, *Max*	CAP	REF TO FIG.
(1)	(2)	(3)	(4)	(5)	(6)
F 6/1	6	3	9	S 7	F$_1$
F 6/2	6	5	11	SV 8·5	F$_2$
F 6/3	6	10	15·5	SV 8·5	F$_3$
F 6/4	6	18	15·5	SV 8·5	F$_3$
F 12/1	12	3	9	S 7	F$_1$
F 12/2	12	5	11	SV 8·5	F$_2$
F 12/3	12	10	15·5	SV 8·5	F$_3$
F 12/4	12	18	15·5	SV 8·5	F$_3$
F 24/1	24	5	11	SV 8·5	F$_2$

NOTE — The length of the lamps is measured between the positions of the caps at which the diameter is 3·5 mm.

TABLE 5 LAMPS USED FOR FOG LIGHTS

(*Clauses* 3.1 *and* 4.1.1)

REF NO. (1)	VOLTS (2)	WATTS (3)	DIAMETER, *Max* (4)	OVERALL LENGTH (5)	LENGTH PIN TO SOLDER, *Max* (6)	LIGHT CENTRE LENGTH (7)	CAP (8)
F 01	12	35	36	66·5	16·5	30 ± 0·15	BA 20S
F 02	12	50	29	64·0	16·0±2	21·5 ± 0·15	P 36S

TABLE 6 ELECTRICAL CHARACTERISTICS OF MINIATURE LAMPS
(SIDE, TAIL AND DASH BOARD LAMPS)

(*Clauses* 3.1, 4.2, 8.4 *and* 8.5)

REF NO.	RATINGS		AGEING PERIOD AT LIFE TEST VOLTS	INITIAL RATINGS OF LAMPS (AVERAGE OF RTQ)				LIFE TEST			LUMEN MAINTENANCE
	Volts	Watts		Test Volts	Watt		Lumen, *Min*	Test Volts	Specified Life	Minimum Average of LTQ	
					Max	*Min*					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
			hours						hours	hours	percent
M 6/1	6	0·6	¼	6·75	0·7	0·5	2·5	6·75	200	156	85
M 6/2	6	2	¼	6·75	2·3	1·7	8·75	6·75	200	156	85
M 6/3	6	4	¼	6·75	4·4	3·6	28	6·75	200	156	85
M 6/4	6	5	¼	6·75	5·5	4·5	40	6·75	200	156	85
M 6/5	6	10	¼	6·75	11	9	100	6·75	200	156	85
M 12/1	12	1·2	¼	13·5	1·4	1·0	7·7	13·50	200	156	85
M 12/2	12	2	¼	13·5	2·3	1·7	7·5	13·50	200	156	85
M 12/3	12	4	¼	13·5	4 4	3.6	28	13 50	200	156	85
M 12/4	12	5	¼	13·5	5·5	4·5	40	13·50	200	156	85
M 12/5	12	10	¼	13·5	11	9	100	13·50	200	156	85
M 24/1	24	2	¼	28·0	3·45	2·55	11·9	28	200	156	85
M 24/2	24	4	¼	28·0	5·5	4·5	28	28	200	156	85
M 24/3	24	5	¼	28·0	7·7	6·3	40	28	200	156	85
M 24/4	24	10	¼	28·0	13·75	11·25	100	28	200	156	85

TABLE 7 ELECTRICAL CHARACTERISTICS OF MEDIUM LAMPS (INTERIOR, STOP-AND-TAIL AND FLASHER LAMPS)

(*Clauses* 3.1, 4.2, 8.4 *and* 8.5)

Ref No.	Ratings		Ageing Period at Life Test Volts	Initial Ratings of Lamps (Average of RTQ)				Life Test			Lumen Maintenance
	Volts	Watts		Test Volts	Watt		Lumen, *Min*	Test Volts	Specified Life	Minimum Average of LTQ	
					Max	*Min*					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
			hours						hours	hours	percent
D 6/1	6	21	¼	6·75	27·56	24·44	400	6·75	100	85	85
D 6/2	6	5	¼	6·75	6·6	5·4	30	6·75	1 000	850	85
		21	¼	6·75	27·56	24·44	400	6·75	100	85	85
D 6/3	6	3	¼	6·75	4·0	3·2	20	6·75	1 000	850	85
		15	¼	6·75	16·5	13·5	270	6·75	100	85	85
D 12/1	12	21	¼	13·5	26·5	23·5	400	13·5	100	85	85
D 12/2	12	5	¼	13·5	6·6	5·4	30	13·5	1 000	85	85
		21	¼	13·5	26·5	23·5	400	13·5	100	85	85
D 24/1	24	21	¼	28·0	29·68	26·32	400	28	100	85	85
D 24/2	24	5	¼	28·0	11	9	35	28	1 000	85	85
		21	¼	28·0	29·68	26·32	400	28	100	85	85

TABLE 8A ELECTRICAL CHARACTERISTICS OF HEAD LIGHT LAMPS (BRITISH PREFOCUS BEAM PATTERN)

(*Clauses* 3.1, 4.2, 8.4 *and* 8.5)

REF NO.	RATINGS		AGEING PERIOD AT LIFE TEST VOLTS	INITIAL RATINGS OF LAMPS (AVERAGE OF RTQ)					LIFE TEST			LUMEN MAINTENANCE
	Volts	Watts		Test Volts	Watt		LUMEN*		Test Volts	Specified Life	Minimum Average of LTQ	
					Max	*Min*	*Min*	*Max*				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
			hours							hours	hours	percent
HA 6/1	6	30	¼	6·3	35	29·6	472	—	7	50	42	85
		24	¼	6·3	28	23·6	359	442	7	50	42	85
HA 12/1	12	50	½	13·2	62·7	53·1	892	—	14	75	63	85
		40	½	13·2	50·1	42·3	670	827	14	100	85	85
HA 24/1	24	54	½	28	74·1	62·7	1 101	—	28	125	100	85
		44	½	28	60·3	50·8	763	947	28	150	120	85

**Max* lumen for dip filament is necessary to avoid glare.

TABLE 8B ELECTRICAL CHARACTERISTICS OF HEAD LIGHT LAMPS (EUROPEAN SYMMETRIC BEAM PATTERN)

(*Clauses* 3.1, 4.2, 8.4 *and* 8.5)

Ref No.	Ratings		Ageing Period at Life Test Volts	Initial Ratings of Lamps (Average of RTQ)					Life Test			Lumen Main-tenance
	Volts	Watts		Test Volts	Watt		Lumen*		Test Volts	Specified Life	Minimum Average of LTQ	
					Max	*Min*	*Min*	*Max*				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
			hours							hours	hours	percent
HB 6/1	6	15	¼	6·75	16·35	13·65	180	190	6·75	100	85	85
		15	¼	6·75	16·35	13·65	180	190	6·75	100	85	85
HB 6/2	6	25	¼	6·75	26·5	23·5	350	375	6·75	100	85	85
		25	¼	6·75	26·5	23·5	250	375	6·75	100	85	
HB 12/1	12	50	¼	13·5	26·5	23·5	350	—	13·5	100	85	85
		40	¼	13·5	26·5	23·5	250	375	13·5	100	85	
HB 12/2	12	35	¼	13·5	38·5	31·5	520	—	13·5	100	85	85
		35	¼	13·5	38·5	31·5	375	560	13·5	100	85	
HB 24/1	24	55	—	28·0	50·7	34·3	665	700	28·0	100	85	85
		50	—	28·0	50·7	34·3	470	700	28·0	100	85	

**Max* lumen for dip filament is necessary to avoid glare.

TABLE 8C ELECTRICAL CHARACTERISTICS OF HEAD LIGHT LAMPS (EUROPEAN ASYMMETRIC BEAM PATTERN)

(*Clauses* 3.1, 4.2, 8.4 *and* 8.5)

REF NO.	RATINGS		AGEING PERIOD AT LIFE TEST VOLTS	INITIAL RATINGS OF LAMPS (AVERAGE OF RTQ)					LIFE TEST			LUMEN MAINTENANCE
	Volts	Watts		Test Volts	Watt*		Lumen†		Test Volts	Specified Life	Minimum Average of LTQ	
					Max	*Min*	*Min*	*Max*				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
			hours							hours	hours	percent
HC 6/1	6	45	½	6	49·5	40·5	600	—	6·75	75	63	85
		45	½	6	44·0	36·0	400	550	6·75	150	126	
HC 12/1	12	45	½	12	49·5	40·5	600	—	13·5	75	63	85
		40	½	12	44·0	36·0	400	550	13·5	50	126	
HC 24/1	24	55	½	24	60·5	49·5	600	—	28·0	75	63	85
		50	½	24	55·0	45·0	400	550	28·0	150	126	

*Watt, *Min* is necessary for flasher designers.

†*Max* lumen for dip filament is necessary to avoid glare.

TABLE 9 ELECTRICAL CHARACTERISTICS OF FESTOON LAMPS

(*Clauses* 3.1, 4.2, 8.4 *and* 8.5)

REF NO.	RATINGS		AGEING PERIOD OF LIFE TEST VOLTS	INITIAL RATINGS OF LAMPS (AVERAGE OF RTQ)				LIFE TEST			LUMEN MAINTENANCE
	Volts	Watts		Test Volts	Watt*		Lumen	Test Volts	Specified Life	Minimum Average of LTQ	
					Max	*Max*	*Max*				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
			hours						hours	hours	percent
F 6/1	6	3	¼	6·75	3·9	3·2	22	6·75	200	156	85
F 6/2	6	5	¼	6·75	5·5	4·5	36	6·75	200	156	85
F 6/3	6	10	¼	6·75	11	9	100	6·75	200	156	85
F 6/4	6	18	¼	6·75	23·7	19·3	200	6·75	200	156	85
F 12/1	12	3	¼	13·5	3·9	3·2	24	13·5	200	156	85
F 12/2	12	5	¼	13·5	5·5	4·5	36	13·5	200	156	85
F 12/3	12	10	¼	13·5	11	9	100	13·5	200	156	85
F 12/4	12	18	¼	13·5	23·7	19·3	200	13·5	200	156	85
F 24/1	24	5	¼	28	7·7	6·3	36	28	200	156	85

TABLE 10 LAMPS USED FOR FOG LIGHTS

(*Clauses* 3.1, 4.2, 8.4 *and* 8·5)

REF NO.	RATINGS		AGEING PERIOD AT LIFE TEST VOLTS	INITIAL RATINGS OF LAMPS (AVERAGE OF RTQ)				LIFE TEST			LUMEN MAINTENANCE
	Volts	Watts		Test Volts	Watts		Lumen	Test Volts	Specified Life	Minimum Average of LTQ	
					Max	*Min*	*Min*				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
			hours						hours	hours	percent
FO 1	12	35	¼	13·5	38·5	31·5	685	11·5	100	85	85
FO 2	12	50	¼	13·2	61·0	50·0	1 150	14	75	63	85

4.1.5 *Solder* — The solder shall be so applied as not to interfere with proper engagement in the holder and to ensure satisfactory electrical contact.

NOTE — It is not essential that the whole surface of the eyelet should be covered with the solder, provided there is good electrical contact between the lead-in wire and the eyelet, and the soldering is done without the wire end being visible.

4.1.6 In the case of prefocus lamps, the main filament shall be connected to the contact which is nearer to the slot of the ring. In the case of BA 20d cap lamps, the main filament shall be connected to the left-hand side of the contact when the cap is viewed from below with the bigger pin at the bottom. In the case of BAY 15d cap lamps the low wattage filament shall be connected to the right-hand contact when viewed with cap towards observer, index pin down and low wattage filament uppermost.

4.1.7 Physical measurements and positioning of filament should tally with those shown in the respective figures.

NOTE — A recommended method for checking the appropriate position of the lamp filament in the case of double filament prefocus lamps with or without shield, when tested in accordance with a screen projection method is described in Appendix B. Any other alternative method as agreed between the supplier and the purchaser can also be used for these measurements.

4.2 Initial Rating Requirements — The average initial ratings of the RTQ, namely, initial watts and initial lumens, shall be in accordance with those specified in the relevant tables (*see* Tables 6 to 10) when measured at test voltages specified therein.

4.2.1 Initial photometric and electrical measurements shall be made after an ageing period as specified in the relevant tables.

4.3 Life Performance Requirements — The life of individual lamp and lumen maintenance of individual lamp at 50 ± 5 percent of the specified life shall comply with the requirements of the relevant tables. If a lamp does not comply with individual lumen maintenance at 50 ± 5 percent life, it shall be considered to have failed at 46 percent life (*see* Tables 6 to 10).

4.4 Vibration Requirements — (*see* **7.5**).

5. MARKING

5.1 Each lamp shall be distinctly and indelibly marked with the following:

a) Mark of origin (the mark of origin may take the form of a trade-mark or manufacturer's name of the responsible vendor);

b) Rated voltage;

- c) Rated wattage;
- d) Type (reference No.). This may be alternatively done on the carton used for packing the lamp; and
- e) Country of manufacture (this marking may be alternatively done on the carton used for packing the lamps).

5.1.1 Lamps may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6. SELECTION OF LAMPS FOR TESTS (SAMPLING)

6.1 Samples for testing shall be selected from lamps belonging to one batch.

6.1.1 *Batch Consisting of 1 000 Lamps or Less* — For batches consisting of 10 or less containers, lamps shall be selected from every container. If a batch consists of more than 10 containers, lamps shall be selected from at least one-half of the total number of containers in the batch with a minimum of 10 containers.

6.1.2 *Batch Consisting of More Than 1 000 Lamps* — Lamps shall be selected, as far as possible, from one-third of the total number of containers in the batch, with a minimum of 10 containers.

6.2 Inspection Test Quantity (ITQ) — Inspection test quantity shall consist of 30 lamps for single filament lamp.

6.3 Rating Test Quantity (RTQ) — Rating test quantity shall be selected from lamps which have passed the inspection test and shall consist of 25 lamps for single filament lamps.

6.4 Life Test Quantity (LTQ) — Life test quantity shall be selected from lamps which have passed the initial rating test and shall consist of 10 lamps for single filament lamps.

6.5 Vibration Test Quantity (VTQ) — The vibration test quantity shall be selected from lamps which have passed the initial rating tests and shall be subject to the agreement between the purchaser and the supplier.

6.6 In the case of double filament lamps, the above scale of sampling (**6.2** to **6.5**) shall apply to each filament separately.

7. TESTS

7.1 Conditions for Testing

7.1.1 *Position of Burning* — For the purpose of the test for initial readings, the lamps shall burn in the vertical position, cap up. In the case of festoon lamps they shall burn in a horizontal position. For life tests and ageing, they shall be burnt horizontally. In the case of lamps for headlight, the plane of the main filament shall also be horizontal during the life and vibration tests.

7.1.2 *Ageing* — Before the initial readings are taken, the lamps shall be aged for a period mentioned in the relevant table at the voltage specified therein.

7.1.3 *Photometry* — Readings shall be taken with a suitable photometric integrator (*see also* IS : 2407-1963*) at the voltage specified in the relevant table.

7.2 Visual Examination and Checking for Mechanical and Physical Requirements — Each lamp of ITQ shall be examined visually as well as checked for physical and mechanical requirements detailed in **4.1** and marking requirements specified in **5**.

7.2.1 *Torsion Test* — Lamps shall be inserted in a special holder which should be fixed to a suitable torsion testing machine. The test shall then be carried out by twisting the bulb. The torques shall not be applied suddenly but increased gradually to the moment specified in **4.1.4**.

7.2.2 In the case of double filament lamps, separate ITQ, as provided for, shall be used for inspection tests on each filament.

7.3 Initial Rating Test — Measurements shall be made for initial watts and initial lumens at the test voltage specified in the relevant table with an integrating photometer. The voltmeter and ammeter, when used for the test, shall have a class index 0·5 or better (*see* IS : 1248-1968† *and* IS : 732-1963‡).

7.3.1 In the case of double filament lamps, separate RTQ's, as provided for, shall be used for rating tests on each filament.

7.4 Life Test — The lamps selected for the life test shall burn throughout life in the normal burning position at the specified test voltage given in the relevant table.

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*Specification for photometric integrators.

†Specification for direct acting electrical indicating instruments.

‡Code of practice for electrical wiring installations (system voltage not exceeding 650 volts) (*revised*).

In the case of double filament lamps separate LTQ's, as provided for, shall be used for life test on each filament.

The voltage shall be ac at 50 Hz and kept within ± 1·0 V during the life test.

In the case of double filament lamps, the position of filament shall be similar to that used in actual practice.

7.4.1 *Voltage Control* — The momentary fluctuations of the test voltage during the life test shall not exceed ± 1 percent.

7.4.2 *Switching On and Off During Life Test* — Lamps on life test shall be switched off twice in 24 hours of operation for a period of not less than 15 minutes, such periods not being considered as part of the life of the lamp.

7.4.3 *Accidentally Broken Lamps* — If one or more lamps break accidentally in handling during life test, the life test results may be computed on the basis of results obtained on the remainder of the LTQ, provided the number of the latter is not less than 9.

7.4.4 *Measurements During Life Test (Efficiency Maintenance)* — Each lamp of the LTQ shall be tested for lumens with an integrating photometer at the test voltage at 50 ± 5 percent of the specified life.

7.4.5 *Duration of Life Test* — For the purpose of computing average life of LTQ, lamps operating beyond 125 percent of the specified life in the life test shall be deemed to have a life equal to 125 percent of the specified life only.

7.5 Vibration Test — The test procedure and parameters to be checked shall be subject to agreement between the purchaser and the supplier (*see also* **0·7**).

8. CONDITIONS OF COMPLIANCE

8.1 General — If any test quantity fails to satisfy any of the requirements of **8.2**, **8.3**, **8.4** and **8.5** the batch shall be rejected and no subsequent tests shall be carried out from the batch.

8.2 Selection of Lamps for Tests — Samples for testing shall be selected at random from lamps belonging to one batch and shall be as specified in **6.1**.

8.3 Mechanical and Physical Requirements and Marking — The number of lamps failing shall not exceed the following qualifying limit for compliance:

	Qualifying Limit
For any single clause (**4.1.1** to **4.1.7** and **5**)	2
For all clauses together	3

8.4 Initial Ratings — A batch shall be considered to comply with the initial rating requirements (*see* **4.2**) if the following conditions are complied with:

a) The average wattage of the RTQ shall not fall outside the minimum and maximum values given in the relevant tables (*see* Tables 6 to 10).

b) The average lumens of the RTQ shall not be less than the minimum for compliance given in the relevant table (*see* Tables 6 to 10).

3.5 Life Performance — The batch shall be considered as complying with life performance requirements (*see* **4.3**) if:

a) The minimum average life of the LTQ shall not be less than the minimum life specified in the relevant tables (*see* Tables 6 to 10).

NOTE — These figures are lower than the specified life in order to cover the statistical uncertainty involved in testing small samples.

b) The number of lamps of the LTQ having lives less than 60 percent of the specified life together with the lamps having lumen maintenance at 50 percent of the specified life less the value specified in the relevant table (*see* Tables 6 to 10) shall not exceed the compliance number given below:

Test Quantity	*Compliance*	*Number*
10	For Group I and IV	4
	For Group II, III and V	2

APPENDIX A

(*Clause* 4.1.3)

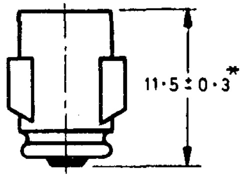
A-1. The dimensions of various caps detailed in Tables 1 to 3 shall be in accordance with the article sheets given in this appendix.

NOTE — Article sheets 1 to 7 conform to IEC Pub 61-1 ' Lamp caps and holders together with gauges for the control of interchangeability and safety, Part I Lamp caps'.

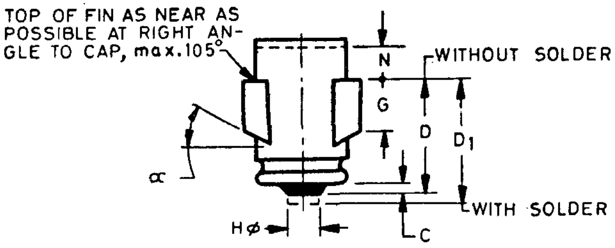
Article Sheet No. 1
BAYONET AUTOMOBILE CAPS
BA 7

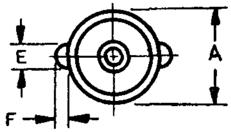
Dimensions in millimetres.

The drawings are intended only to indicate the dimensions to be controlled.



Caps may be made with a flare* the diameter of which shall not be more than 0·5 mm greater than the maximum permissible diameter of the corresponding cap without a flare.


TOP OF FIN AS NEAR AS POSSIBLE AT RIGHT ANGLE TO CAP, max.105°
N
WITHOUT SOLDER
G
D
D1
α
WITH SOLDER
Hφ
C



DIMENSION	UNMOUNTED CAPS†		CAPS ON FINISHED LAMPS	
	Min	*Max*	*Min*	*Max*
A (2)	6·87	7·05 (3)	6·87	7·10 (3)
C	0·90	—	—	—
D	7·7	8·1	—	—
D_1	—	—	7·7	8·7
E	1·8	2·0	1·8	2·0
F	0·7	0·9	0 7	0·9
G	3·4	4·0	3·4	4·0
H (1)	2·4	2·6	2·4	2·6
N (2)	2·6	—	2·6	—
α	Approx: 30°		Approx: 30°	

*These dimensions are solely for cap design and are not to be gauged on the finished lamp.

†The values shown below are solely for cap design and are not to be gauged, unless specified otherwise.

1) This dimension is checked with a millimetre scale.

2) Dimension *N* denotes the minimum length over which dimension *A* shall conform; below this length, dimension *A* maximum shall not be exceeded.

IEC Ref No. 7004-15-2

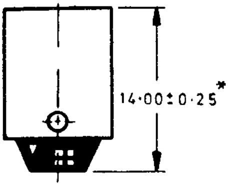
Article Sheet No. 2

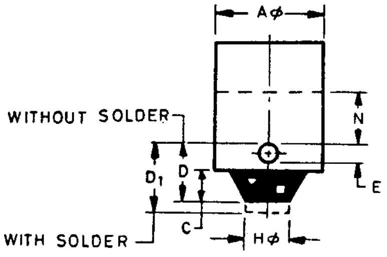
BAYONET AUTOMOBILE CAPS

BA 9

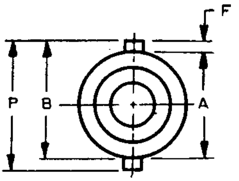
Dimensions in millimetres.

The drawings are intended only to indicate the dimensions to be controlled.





Caps may be made with a flare* the diameter of which shall be not more than 0·5 mm greater than the maximum permissible diameter of the corresponding cap without a flare.



DIMENSION	UNMOUNTED CAPS†		CAPS ON FINISHED LAMPS	
	Min	*Max*	*Min*	*Max*
A (2)	9·08	9·20	9·08	9·25
B (3)	9·75	10·11	9·75	10·16
C	1·5	—	—	—
D	4·3	5·2	—	—
D_1	—	—	4·3	5·9
E	1·5	1·7	1·5	1·7
F (3)	0·64	—	0·64	—
H (1)	3·5	4·0	3·5	4·0
N (2)	4·5	—	4·5	—
P	—	10·95	—	11·0

*These dimensions are solely for cap design and are not to be gauged on the finished lamp.

†The values shown below are solely for cap design and are not to be gauged, unless specified otherwise.

1) This dimension is checked with a millimetre scale.

2) Dimension *N* denotes the minimum length over which dimension *A* shall conform; below this length, dimension *A Max* shall not be exceeded.

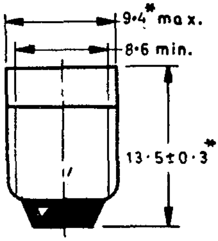
3) The radius of the edge of the relevant pin shall not exceed 0·2 mm when dimension *B* is at the minimum value of 9·75 mm. If dimension *B* exceeds 9·75 mm, the radius may be increased accordingly. This requirement applies only to the half of the edge adjacent to the bulb.

IEC Ref No. 7004-14-6

Article Sheet No. 3
SCREW CAPS
E 10

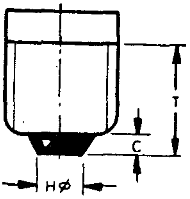
Dimensions in millimetres.

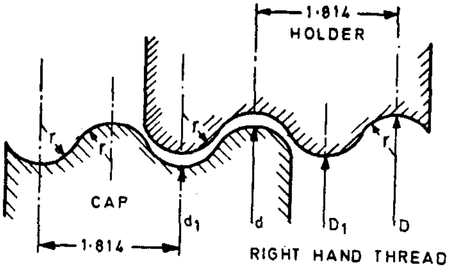
The drawings are intended only to indicate the dimensions to be controlled.



Caps may be made with a flare* the diameter of which shall be not more than 1 mm greater than the maximum permissible diameter of the corsesponding cap without a flare.

For finished lamps the creepage distance over insulation shall be not less than 2 mm.





Dimension		E 10/13 Min	E 10/13 Max
Cap	*C*	Approx: 2·5*	
	H (1)	3·5	4·0
	T (2)	9·5	—
	d	9·36	9·53
	d_1	8·34	8·51
Holder	*D*	9·61	9·78
	D_1	8·59	8·76
	r		0·531

*These dimensions are solely for cap design and are not to be gauged on the finished lamp.

1) This dimension is checked with a millimetre scale.

2) 'T' is the distance from the contact plate of the cap to the completion of the thread.

IEC Ref No. 7004-22-5

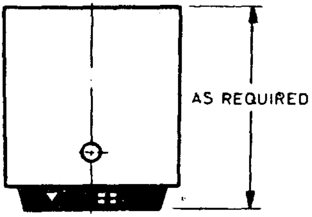
Article Sheet No. 4

BAYONET AUTOMOBILE CAPS

BA 15

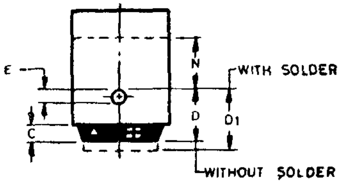
Dimensions in millimetres.

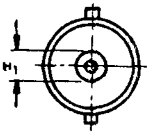
The drawings are intended only to indicate the dimensions to be controlled.



Recommended length 17·50 ± 0·25*
19·00 ± 0·25 and 21·00 ± 0·25*

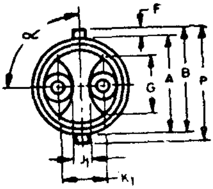
Caps may be made with a flare* the diameter of which shall be not more than 1 mm greater than the maximum permissible diameter of the corresponding cap without a flare.



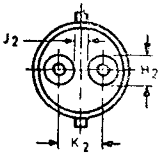


All other relevant dimensions
as for BA 15 d

BA 15s



Oval Contacts



Circular Contacts

BA 15d

(Continued)

Article Sheet No. 4 — *Contd*

DIMENSION	UNMOUNTED CAPS*		CAPS ON FINISHED LAMPS	
	Min	*Max*	*Min*	*Max*
A (1)	15·05	15·25	15·05	15·30
B (2)	15·65	16·10	15·65	16·15
C	1·5	—	—	—
D	6·0	6·6	—	—
D_1	—	—	6·32	7·5
E	1·8	2·2	1·8	2·2
F (2)	0·64	—	0·64	—
G	Approx: 9		—	
H_1	4·5	5·2	—	—
H_2	4·5	—	—	—
J_1	3·0	—	—	—
J_2	1·7	—	—	—
K_1	7·0	8·0	—	—
K_2	6·5	7·1	—	—
N (1)	8·9	—	8·9	—
P	—	16·95	—	17·0
α	Nom 90°		—	

*These dimensions/values are solely for cap design and are not to be gauged on the finished lamp.

1) Dimension *N* denotes the minimum length over which both the minimum and the maximum limits of dimension *A* shall be observed. Below dimension *N* only the limits for dimension *A* maximum apply.

Compliance with the requirements regarding dimension *A* maximum shall be checked only with the relevant gauge.
The requirements regarding dimension *A* minimum are as follows:

a) In every horizontal plane within dimension *N*, there shall be at least one direction in which the diameter is 15·05 mm or greater.

b) In no direction in any plane within dimension *N* shall the diameter be less than 14·92 mm.

Compliance with these requirements shall be checked with a suitable caliper measuring device having flat anvils 3 mm wide and a measuring accuracy of + 0·0 — 0·01 mm. The points of measurement shall extend from a plane 0·5 mm above the pins up to the minimum value of dimension *N*.

2) The radius of the edge of the relevant pin shall not exceed 0·2 mm when dimension *B* is at the minimum value of 15·65 mm. If dimension *B* exceeds 15·65 mm the radius may be increased accordingly. This requirement applies only to the half of the edge adjacent to the bulb.

IEC Ref No. 7004-11A-7

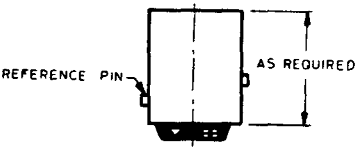
Article Sheet No. 5

BAYONET AUTOMOBILE CAPS

BAY 15d

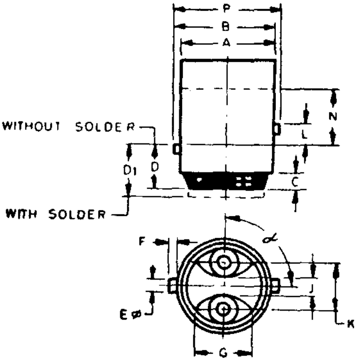
Dimensions in millimetres.

The drawings are intended only to indicate the dimensions to be controlled.



Recommended Length : 19·0 ± 0·25* & 21·0 ± 0·25*

Caps may be made with a flare* the diameter of which shall be not more than 1 mm greater than the maximum permissible diameter of the corresponding cap without a flare.



Circular contact plates are permissible.

(*Continued*)

Article Sheet No. 5 — *Contd*

DIMENSION	UNMOUNTED CAPS*		CAPS ON FINISHED LAMPS	
	Min	*Max*	*Min*	*Max*
A (1)	15·05	15·25	15·05	15·30
B (2)	15·65	16·10	15·65	16·15
C	1·5	—	—	—
D	6·0	6·6	—	—
D_1	—	—	6·32	7·5
E	1·8	2·2	1·8	2·2
F (2)	0·64	—	0·64	—
G	Approx: 9		—	
H	4·5	—	—	—
J_1	3·0	—	—	—
J_2	1·7	—	—	—
K_1	7·0	8·0	—	—
K_2	6·5	7·1	—	—
L	3·0	3·4	3·0	3·4
N (1)	8·9	—	8·9	—
P	—	16·95	—	17·0
α	Nom. 90°		—	

*These dimensions/values are solely for cap design and are not to be gauged on the finished lamp.

1) Dimension *N* denotes the minimum length over which both the minimum and the maximum limits of dimension *A* shall be observed. Below dimension *N* only the limits for dimension *A* maximum apply.

Compliance with the requirements regarding dimension *A* maximum shall be checked only with the relevant gauge.

The requirements regarding dimension *A* minimum are as follows:

a) In every horizontal plane within dimension *N*, there shall be at least one direction in which the diameter is 15·05 mm or greater.

b) In no direction in any plane within dimension *N* shall the diameter be less than 14·92 mm.

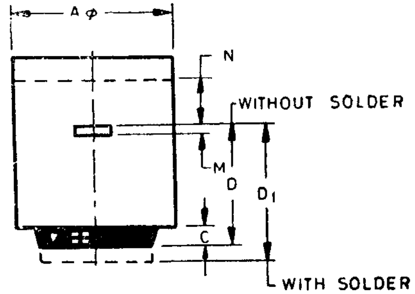
2) The radius of the edge of the relevant pin shall not exceed 0·2 mm when dimension *B* is at the minimum value of 15·65 mm. If dimension *B* exceeds 15·65 mm, the radius may be increased accordingly. This requirement applies only to the half of the edge adjacent to the bulb.

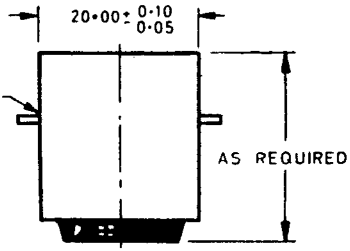
IEC Ref No. 7004-11B-6

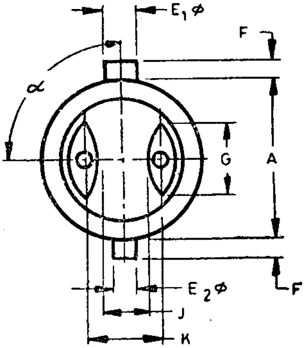
Article Sheet No. 6
BAYONET AUTOMOBILE CAPS
BA 20

Dimensions in millimetres.

The drawings are intended only to indicate the dimensions to be controlled.







A deviation of 0·15 mm either side between the centre line of the small lug and the centre line through the reference lug and the cap centre is permitted. It is checked by the relevant gauge.

DIMENSION	*Min*	*Max*
A	19·95	20·1
C	1·5	—
D (3)	15·5	16·0*
D_1	—	17·0
E_1	4·4	4·5
E_2	2·9	3·0
F	1·9	2·2
G (1)	Approx : 12	
H (1)	4·5	5·2
J (1)	3·0	—
K	9·5*	10·0*
M	0·4	—
N (2)	5·0	—
r	—	0·2
α	82°30′	97°30′

*These dimensions are solely for cap design and are not to be gauged on the finished lamp:

1) This dimension is checked with a millimetre scale.

2) '*N*' denotes the minimum length to which dimension *A* shall conform.

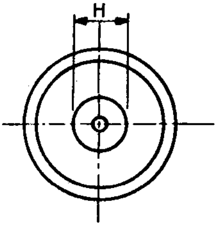
3) A deviation in height between the two lugs of ± 0·15 mm is permitted. It is checked by the relevant gauge.

IEC Ref No. 7004-12-5

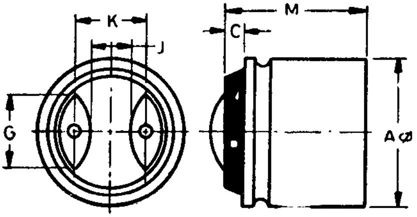
Article Sheet No. 7
PREFOCUS CAPS
P 36

Dimensions in millimetres.

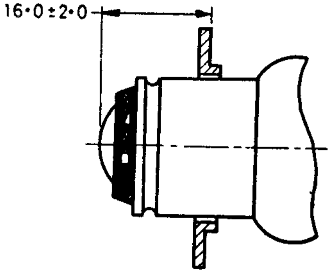
The drawings are intended only to indicate the dimensions to be controlled.



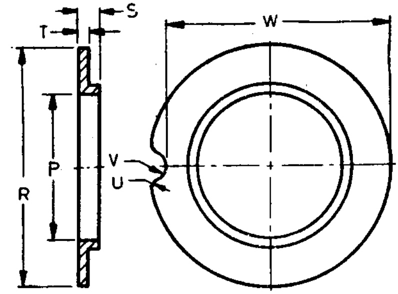
522 s



522 d



ASSEMBLY POSITION OF COLLAR ON FINISHED LAMP



FOCUSSING COLLAR

Provided the flange is correctly placed it is permitted to assemble the colloars that the lip faces towards the base of the cap.

DIMENSION	*Min*	*Max*
A	21·75*	22·10*
C	1·5*	—
G (1)	10·0	—
H (1)	Approx : 10	
J (1)	4·0	—
K	10·0*	11·3*
M	20·5*	21·5*
P	22·10*	22·17*
R	35·85	36·0
S	Approx : 2·5*	
T	0·74	0·84
U	Approx : 0·5*	
V	2·5	2·75
W	34·0	34·5

The assembly of the collar to the cap shall be such that the recess is in the line with the plane of the two contacts within ± 15°.

*These dimensions are solely for cap design and are not to be gauged on the finished lamp.

1) These dimensions are checked with a millimetre scale.

IEC Ref No. 7004-49-3

APPENDIX B

(*Clause* 4.1.7)

SCREEN PROJECTION REQUIREMENTS FOR PREFOCUS LAMPS (DOUBLE FILAMENT WITH AND WITHOUT SHIELD)

B-0. This test is used to determine whether a lamp complies with the requirments of **4.1.7** by checking whether the main beam filament is:

a) correctly positioned relative to the major axis of the cap flange; and

b) has a light centre length within the specified limits, whether the dipped beam filament is correctly located relative to the main beam filament and whether the shield is correctly located relative to the dipped beam filament.

B-1. TEST SCREENS

B-1.1 Magnified targets are drawn with the proportions of the permitted tolerances given in Fig. 1, 2 and 3 on test screens which are divided into two parts:

a) A fixed screen on to which the side and front elevations of the main beam filament assembly are projected.

b) A screen, used to check the position of the dipped beam filament relative to the light centre of the main beam filament, which is movable normally to the main axis of the cap flange and is superimposed on the fixed screen.

B-2. TEST PROCEDURE

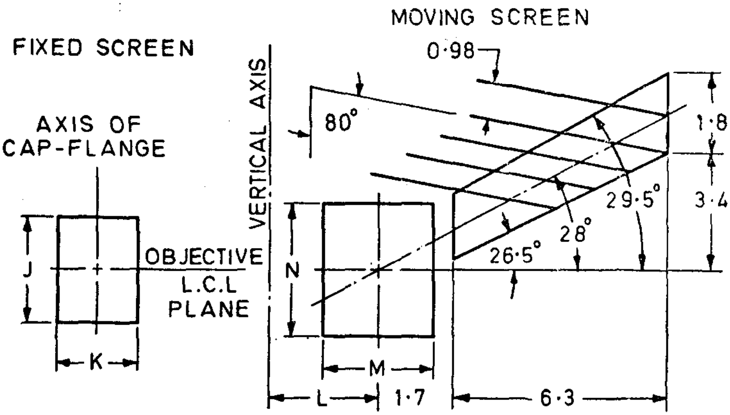
B-2.1 Images of the filaments with the same degree of magnification are projected on to the test screens.

B-3. REQUIREMENTS

B-3.1 Side Elevation

a) *All Lamps* — The image of the main beam filament shall fall completely within the target area of the fixed screen. The movable screen is then adjusted so that the vertical axis bisects the image of the main beam filament. The image of the dipped beam filament shall fall within the target area.

b) *Lamps With Shields* — The moving screen is adjusted so that the 28° line bisects the image of the dipped filament. The lower end of the shield image shall then fall within the target area, and the flat portion of the shield shall be totally enclosed within any adjacent pair of 80° lines.



Ratings	Dimension, mm				
	J	*K*	*L*	*M*	*N*
6 V 30/24 W	2·2	1·9	3·25	2·4	2·7
12 V 50/40 W	2·6	2·6	3·0	2·5	3·0
24 V 54/44 W	3·25	2·75	3·75	3·25	3·75

FIG. 1 TEST SCREEN : DOUBLE FILAMENT WITH AND WITHOUT SHIELD

B-3.2 Front Elevation

a) 6 V 30/24 W (vertical dip) (*see* Fig. 2). The movable screen is adjusted so that the image of the main beam filament falls symmetrically within the area *ABCD*. The axis of the main beam filament shall fall within the limits on the fixed screen and the image of the dipped beam filament shall fall within the area *EFGH*.

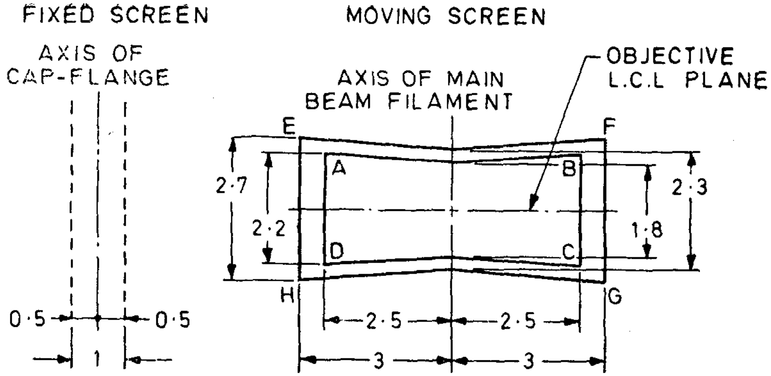
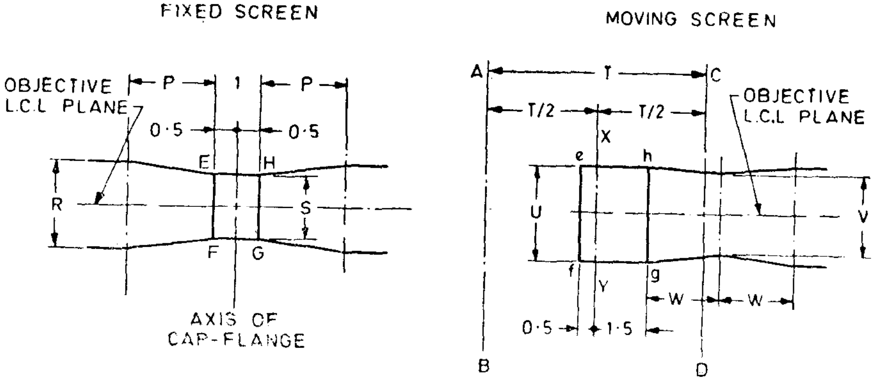


FIG. 2 TEST SCREEN : 6 V 30/24 W LAMPS VERTICAL DIP

b) All other ratings (right-hand drive, left dip) (*see* Fig. 3). The image of the main beam filament shall fall completely within the upper and lower limiting lines on the fixed screen. The movable screen is then adjusted so that the image of the main beam filament falls symmetrically within the limiting lines *AB* and *CD*.

The vertical axis *XY* then bisects the filament image and shall fall within the limiting lines *EF* and *GH* on the fixed screen. The image of the dipped beam filament shall fall completely within the target area of the movable screen with the end turn (that nearest the axis of the cap flange) within the area *EFGH*.



RATING	DIMENSION, mm						
	P	*R*	*S*	*T*	*U*	*V*	*W*
12 V 50/40 W	3·25	2·6	2·1	6·75	3·0	2·5	2·35
24 V 54/44 W	3·25	3·25	2·75	6·75	3·75	3·25	2·25

FIG. 3 TEST SCREEN : ALL OTHER RATINGS

(*Continued from page* 2)

Members	*Representing*
Shri R. Bhandari	Bitoni Lamps Pvt Ltd, Faridabad
Shri R, D. Khanna (*Alternate*)	
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Maj S. K. Dewan (*Alternate*)	
Shri P. Sharan Gupta	Auto Lamps Ltd, Faridabad
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Shri K. K. Rohatgi	Binay Electricals and Appliances Pvt Ltd, Calcutta
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Plot No. 62-63, Unit VI, Ganga Nagar, BHUBANESHWAR 751001	40 36 27
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Plot No. 43, Sector 16 A, Mathura Road, FARIDABAD 121001	8-28 88 01
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53/5 Ward No.29, R.G. Barua Road, 5th By-lane, GUWAHATI 781003	54 11 37
5-8-56C, L.N. Gupta Marg, Nampally Station Road, HYDERABAD 500001	20 10 83
E-52, Chitaranjan Marg, C-Scheme, JAIPUR 302001	37 29 25
117/418 B, Sarvodaya Nagar, KANPUR 208005	21 68 76
Seth Bhawan, 2nd Floor, Behind Leela Cinema, Naval Kishore Road, LUCKNOW 226001	23 89 23
NIT BUilding, Second Floor, Gokulpat Market, NAGPUR 440010	52 51 71
Patliputra Industrial Estate, PATNA 800013	26 23 05
Institution of Engineers (India) Building 1332 Shivaji Nagar, PUNE 411005	32 36 35
T.C. No. 14/1421, University P. O. Palayam, THIRUVANANTHAPURAM 695034	6 21 17

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*Sales Office is at 5 Chowringhee Approach, P.O. Princep Street, CALCUTTA 700072	27 10 85
†Sales Office is at Novelty Chambers, Grant Road, MUMBAI 400007	309 65 28
‡Sales Office is at 'F' Block, Unity Building, Narashimaraja Square, BANGALORE 560002	222 39 71

Printed at Simco Printing Press, Delhi, India

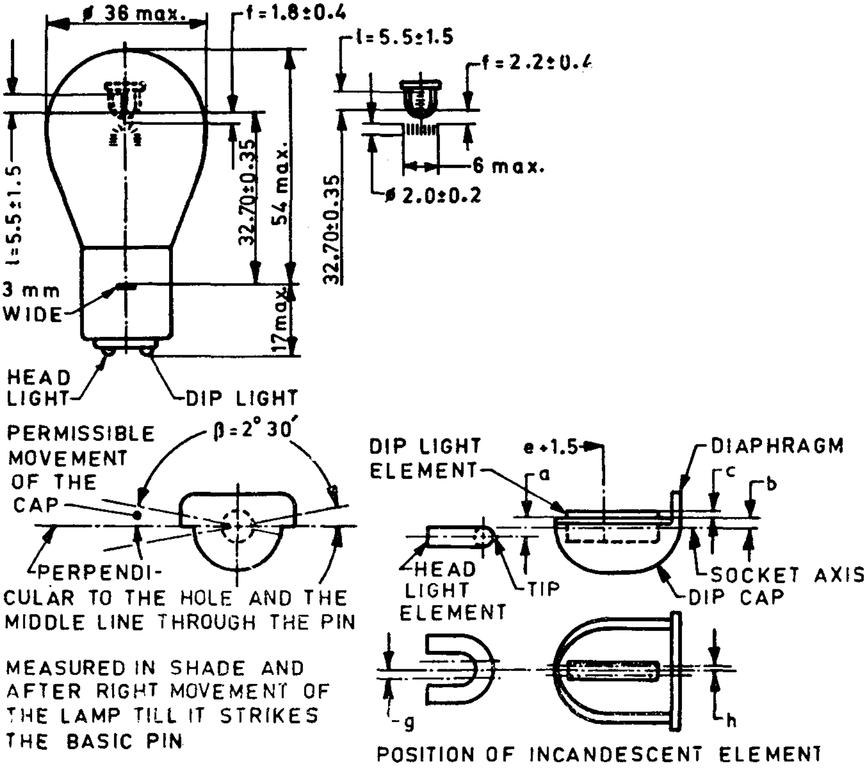
AMENDMENT NO. 1 MARCH 1985

TO

IS : 1606 - 1979 SPECIFICATION FOR AUTOMOBILE LAMPS

(*Second Revision*)

(*Page* 11, *Table* 3B) — Substitute the following for the existing figure:



$a = 0{\cdot}6 \pm 0{\cdot}35$ $e = 32{\cdot}70 \pm 0{\cdot}35$

$b = 0{\cdot}2 \pm 0{\cdot}35$ $g = 0{\cdot}5$ *max*

$c = 0{\cdot}5 \pm 0{\cdot}30$ $h = 0{\cdot}5$ *max*

All dimensions in millimetres.

(*Page* 11, *Table* 3B, *Ref No.* HB 12/1, *Column* 3) — Substitute ‘$\substack{25\\25}$’ *for* ‘$\substack{50\\40}$’.

Page 16, *Table* 7, *Ref Nos.* D 12/2 *and* D 24/2, *Column* 11) — Substitute $\substack{850\\85}$’ *for* ‘$\substack{85\\85}$’ at both the places.

(*Page* 18, *Table* 8B, *Ref No.* HB 6/1) — Substitute ‘$\substack{180\\125}$’ *for* ‘$\substack{180\\180}$’ in column 8 and ‘$\substack{—\\190}$’ *for* ‘$\substack{190\\190}$’ in column 9.

(*Page* 18, *Table* 8B, *Ref No.* HB 6/2, *Column* 9) — Substitute ‘$\substack{—\\375}$’ *for* ‘$\substack{375\\375}$’.

(*Page* 18, *Table* 8B, *Ref No.* HB 12/1, *Column* 3) — Substitute ‘$\substack{25\\25}$’ *for* ‘$\substack{50\\40}$’.

(*Page* 18, *Table* 8B, *Ref No.* HB 24/1) — Substitute the following for the existing row:

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HB 24/1	24	45 40	— —	28·0 28·0	49·5 44·0	40·5 36·0	665 470

(9)	(10)	(11)	(12)	(13)
— 700	280 28·0	100 100	85 85	85

(*Page* 19, *Table* 8C, *Ref No.* HC 6/1, *Column* 3) — Substitute ‘$\substack{45\\40}$’ *for* ‘$\substack{45\\45}$’.

(*Page* 19, *Table* 8C, *Ref No.* HC 12/1, *Column* 11) — Substitute ‘$\substack{75\\150}$’ *for* ‘$\substack{75\\50}$’.

(*Page* 20, *Table* 9) — Substitute ‘ *Min* ’ *for* ‘ *Max* ’ in the headings of column 7 and 8.

(*Page* 20, *Table* 9, *Ref Nos.* F 6/4 *and* F 12/4) — Substitute ‘ 19·8 ’ *for* ‘ 23·7 ’ in column 6 and ‘ 16·2 ’ *for* ‘ 19·3 ’ in column 7 at both the places.

(ETDC 23)

Printed at Simco Printing Press, Delhi, India

AMENDMENT NO. 2 DECEMBER 1994
TO
IS 1606 :1979 SPECIFICATION FOR AUTOMOBILE LAMPS
(*Second Revision*)

(*Page* 6, *clause* **3.1**) – Substitute the following for the existing clause :

'**3.1** The various particulars of automobile lamps covered by the following seven groups are given in Tables 1 to 6:

Group I	Automobile lamps such as side, tail, dashboard and interior lighting lamps (*see* Table 1)
Group II	Other types of interior lighting, stop-tail and direction indicator lamps which are bigger than Group I in size (*see* Table 2)
Group III	Lamps for headlights wherein the luminous intensity, focussing, etc, are important to give required beam pattern (*see* Tables 3A, 3B, 3C, 3D and 3E)
Group IV	Festoon lamps (*see* Table 4)
Group V	Lamps used for fog and revolving/flashing lights (*see* Table 5)
Group VI	Wedge type bulbs (*see* Table 6)'

(*Page* 7, *clause* **3.1.1**) – Substitute the following for the existing clause:

'**3.1.1** *Typical Shapes of Lamps* – For easy identification, the typical shapes of various lamps are given in relevant tables.'

(*Page* 7, *clause* **4.1.1,** *line* 3)– Delete the words '(*see* Tables 1 to 5)'.

(*Page* 7, *clause* **4.1.4**) – Substitute the following for the existing clause:

'**4.1.4** *Attachment of Caps to Glass Shells* – The caps shall be attached to the glass shells so strongly as to withstand torsion test carried out in accordance with **7.2.1** with the following torsional moments both during the inspection test and at the end of the life test:

Types of Cap	*Torsional Moment* Nm
BA 7	Under consideration
BA 9	0.23
E 10	0.23
BA 15	1.15
BAY 15	1.15

Types of Cap	*Torsional Moment* Nm
P 36/21 x 22	1.15
BA 20	1.15
P 15d 25-1	1.15
P 15d 25-3	1.15
P 30d 10-3	1.15
P 43t 38	1.15
P 45t 41	1.15’

(*Page* 8, *Table* 1) – Substitute the following for the existing table except for the figures :

Table 1 Miniature Automobile Lamps (Side, Tail and Dashboard Lamps)
(*Clauses* 3.1 *and* 4.1.1)

Ref No.	Volt	Watt	Diameter *Max*	Overall Length *Max*	Pin to Crown *Max*	Length Pin to Solder *Max*	Light Centre Length	Cap	Ref to Fig.	Initial Ratings of Lamps (Average of RTQ)				Life Test		Lumen	
										Test Volts	Watt		Lumen	Test Volts	Specified Life (h)	Minimum Average of LTQ	Maintenance (%)
			A	*B*	*C*	*D*	*E*				*Max*	*Min*	*Min*				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
M 6/1	6	0.6	6.8	20.7	12	8.7	–	BA 7S	M_1	6.75	0.7	0.5	–	6.75	200	156	85
M 6/2	6	1.2	6.8	20.7	12	8.7	–	BA 7S	M_1	6.75	1.0	0.8	–	6.75	200	156	85
M 6/3	6	2.0	8.8	23.9	18.5	5.9	–	BA 9S	M_2	6.75	2.3	1.7	8	6.75	200	156	85
M 6/4	6	4.0	8.8	27.4	21.5	5.9	15 ± 2	BA 9S	M_3	6.75	4.4	3.6	26	6.75	200	156	85
M 6/5	6	5.0	19.0	37.5	30	7.5	19 ± 2	BA 15S	M_4	6.75	5.5	4.5	37	6.75	200	156	85
M 6/6	6	10.0	19.0	37.5	30	7.5	19 ± 2	BA 15S	M_4	6.75	11.0	9.0	100	6.75	200	156	85
M 6/7	6	3.0	8.8	23.9	18.0	5.9	13 ± 2	BA 9S	M_2	6.75	3.3	2.7	18	6.75	200	156	85
M 6/8	6	3.0	11.7	23.9	18.0	5.9	12.7 ± 2	BA 9S	M_4	6.75	3.3	2.7	18	6.75	200	156	85
M 12/1	12	1.2	6.8	20.7	12	8.7	–	BA 7S	M_1	13.5	1.4	1.0	–	13.5	200	156	85
M 12/2	12	2.0	6.8	20.7	12	8.7	–	BA 7S	M_1	13.5	2.3	1.7	7	13.5	200	156	85
M 12/3	12	2.0	8.8	23.9	18	5.9	–	BA 9S	M_2	13.5	2.3	1.7	7	13.5	200	156	85
M 12/4	12	4.0	8.8	27.4	21.5	5.9	15 ± 2	BA 9S	M_2	13.5	4.4	3.6	26	13.5	200	156	85
M 12/5	12	5.0	19.0	37.5	30	7.5	19 ± 2	BA 15S	M_4	13.5	5.5	4.5	37	13.5	200	156	85
M 12/6	12	10.0	19.0	37.5	30	7.5	19 ± 2	BA 15S	M_4	13.5	11.0	9.0	100	13.5	200	156	85
M 12/7	12	3.4	8.8	23.9	18	5.9	13 ± 2	BA 9S	M_2	13.5	3.8	3.0	17	13.5	200	156	85
M 12/8	12	3.4	11.7	23.9	18.0	5.9	12.7 ± 2	BA 9S	M_4	13.5	3.8	3.0	17	13.5	200	156	85
M 12/9	12	8.0	19.0	37.5	30	7.5	19 ± 2	BA 15S	M_4	13.5	8.8	7.2	75	13.5	200	156	85
M 24/1	24	2.0	8.8	23.9	18	5.9	–	BA 9S	M_2	28.0	3.5	2.5	12.0	28	200	156	85
M 24/2	24	4.0	8.8	27.4	21.5	5.9	15 ± 2	BA 9S	M_3	28.0	5.5	4.5	26.0	28	200	156	85
M 24/3	24	5.0	19.0	37.5	30	7.5	19 ± 2	BA 15S	M_4	28.0	7.7	6.3	37.0	28	200	156	85
M 24/4	24	10.0	19.0	37.5	30	7.5	19 ± 2	BA 15S	M_4	28.0	13.8	11.2	100	28	200	156	85
M 24/5	24	2.0	6.8	20.7	12	8.7	–	BA 7S	M_1	28.0	3.5	2.5	12.0	28	200	156	85

NOTES

1 Lamps with Ref No. M 6/1, M 6/2, M 6/7, M 12/7 and M 12/9 shall be phased out after 30 March 1995 and therefore are not intended for use in new designs.

2 For the dimension *A*, if agreed between the purchaser and the supplier, 7.2 and 9.5 are permissible in place of 6.8 and 8.8 respectively.

3 All dimensions are in millimetres.

4 Ageing period at test voltage shall be 15 minutes.

(*Page* 9, *Table* 2) – Substitute the following for the existing table except for the figures:

Table 2 Medium Lamps (Interior, Stop-and-Tail and Flasher Lamps)

(*Clauses* 3.1 *and* 4.1.1)

Ref No.	Volt	Watt	Diameter *Max*	Overall Length *Max*	Pin to Crown *Max*	Length Pin to Solder *Max*	Light Centre Length	Cap	Ref to Fig.	Initial Ratings of Lamps (Average of RTQ)				Life Test		Lumen	
										Test Volts	Watt		Lumen	Test Volts	Specified Life (h)	Minimum Average of LTQ	Maintenance (%)
			A	*B*	*C*	*D*	*E*				*Max*	*Min*	*Min*				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
D 6/1	6	21	26.5	52.5	45	7 ± 0.5	31.8 ± 2	BA 15s	D1	6.75	28	24	370	6.75	100	85	85
D 6/2	6	5	26.5	52.5	45	7 ± 0.5	31.8 ± 2	BAY 15d	D2	6.75	6.6	5.4	26	6.75	1000	850	85
		21								6.75	28	24	350	6.75	100	85	85
D 6/3	6	3	26.5	52.5	45	7 ± 0.5	31.8 ± 2	BAY 15d	D2	6.75	4.0	3.2	20	6.75	1000	850	85
		15								6.75	16.5	13.5	180	6.75	100	85	85
D 6/4	6	5	26.5	52.5	45	7 ± 0.5	31.8 ± 2	BAY 15d	D2	6.75	6.6	5.4	26	6.75	1 000	850	85
		10								6.75	11.0	9.0	90	6.75	100	85	85
D 6/5	6	5	26.5	52.5	45	7 ± 0.5	31.8 ± 2	BAY 15d	D2	6.75	6.6	5.4	26	6.75	1 000	850	85
		18								6.75	21.5	19.8	200	6.75	100	85	85
D 12/1	12	21	26.5	52.5	45	7 ± 0.5	31.8 ± 2	BA 15s	D1	13.5	26.5	23.5	370	13.5	100	85	85
D 12/2	12	5	26.5	52.5	45	7 ± 0.5	31.8 ± 2	BAY 15d	D2	13.5	6.6	5.4	26	13.5	1 000	850	85
		21								13.5	26.5	23.5	350	13.5	100	85	85
D 12/3	12	5	26.5	52.5	45	7 ± 0.5	31.8 ± 2	BAY 15d	D2	13.5	6.6	5.4	26	13.5	1000	850	85
		10								13.5	11.0	9.0	90	13.5	100	85	85
D 12/4	12	10	26.5	52.5	45	7 ± 0.5	31.8 ± 2	BA 15s	D1	13.5	11.0	9.0	100	13.5	100	85	85
D 12/5	12	15	26.5	52.5	45	7 ± 0.5	31.8 ± 2	BA 15s	D1	13.5	16.5	13.5	180	13.5	100	85	85
D 12/6	12	10	26.5	52.5	45	7 ± 0.5	31.8 ± 2	BA 15d	D2	13.5	11.0	9.0	90	13.5	1 000	850	85
		21								13.5	26.5	23.5	350	13.5	100	85	85
D 12/7	12	5	26.5	52.5	45	7 ± 0.5	31.8 ± 2	BAY 15d	D2	13.5	6.6	5.4	26	13.5	1000	850	85
		18								13.5	19.3	16.2	200	13.5	100	85	85
D 24/1	24	21	26.5	52.5	45	7 ± 0.5	31.8 ± 2	BA 15s	D1	28	30	26	370	28	100	85	85
D 24/2	24	5	26.5	52.5	45	7 ± 0.5	31.8 ± 2	BAY 15d	D2	28	11.0	9.0	26	28	1 000	850	85
		21								28	30	26	350	28	100	85	85
D 24/3	24	15	26.5	52.5	45	7 ± 0.5	31.8 ± 2	BA 15s	D1	28	16.5	13.5	180	28	100	85	85
D 24/4	24	21	26.5	52.5	45	7 ± 0.5	31.8 ± 2	BA 15d	D2	28	30	26	370	28	100	85	85

NOTES

1 Lamps D 6/2, D 6/4, D 12/5, D 12/7 shall be phased out and are not recommended for use in new design after 30 March 1995.

2 Ageing period at test voltage shall be 15 minutes.

3 All dimensions are in millimetres.

(*Page* 10, *Table* 3A) – Substitute the following for the existing table except for the figures:

Table 3A Head Light Lamps (Anglo American Pattern)

Ref No.	Volt	Watt	Diameter *Max*	Overall Length *Max*	Length Pin to Solder *Max*	Light Centre Length	Cap	Filament	Initial Ratings of Lamps (Average of RTQ)					Life Test		Lumen	
									Test Volts	Watt		Lumen		Test Volts	Specified Life (h)	Minimum Average of LTQ	Maintenance (%)
			A	*B*	*C*	*D*				*Max*	*Min*	*Min*	*Max*				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
HA 6/1	6	30	29	64	16 ± 2	21.5 ± 0.5	P36	Driving	6.3	35	29	470	–	7	50	42	85
		24						Passing	6.3	28	23	360	445	7	50	42	85
HA 12/1	12	50	29	64	16 ± 2	21.5 ± 0.5	P36	Driving	13.2	63	53	890	–	14	75	63	85
		40						Passing	13.2	50	42	670	830	14	100	85	85
HA 24/1	24	54	29	64	16 ± 2	21.8 ± 0.5	P36	Driving	28.0	74	62	1 100	–	28	125	100	85
		44						Passing	28.0	60	51	760	950	28	150	120	85

NOTES

1 All dimensions are in millimetres.

2 Ageing period at test voltage shall be 15 minutes for HA 6/1 and 30 minutes for other lamps.

3 The lamps HA 6/1, HA 12/1, and HA 24/1 shall be phased out and are not recommended for new design after 30 March 1995.

(*Page* 11, *Table* 3B, figure) – Delete values after '*f*' from the figure.

(*Page* 11, *Table* 3B) – Substitute the following for the existing table except for the figures:

Table 3B Head Light Lamps (Symmetric Beam Pattern)

Ref No.	**Volt**	**Watt**	**Diameter** *Max*	**Overall Length** *Max*	**Dimension** *f*	**Length Pin to Solder** *Max*	**Light Centre Length**	**Cap**	**Filament**	**Initial Ratings of Lamps (Average of RTQ)**					**Life Test**		**Lumen**	
										Test Volts	Watt		Lumen		Test Volts	Specified Life (h)	Minimum Average of LTQ	Maintenance (%)
											Max	*Min*	*Min*	*Max*				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
HB 6/1	6	15	36	71	1.8 ± 0.6	17.0	32.7 ± 0.55	BA 20d	Driving	6.75	16.5	13.0	180	–	6.75	100	85	85
		15							Passing	6.75	16.5	13.0	125	190	6.75	100	85	85
HB 6/2	6	25	36	71	1.8 ± 0.6	17.0	32.7 ± 0.55	BA 20d	Driving	6.75	26.5	23.5	350	–	6.75	100	85	85
		25							Passing	6.75	26.5	23.5	250	375	6.75	100	85	85
HB 12/1	12	25	36	71	1.8 ± 0.6	17.0	32.7 ± 0.55	BA 20d	Driving	13.5	26.5	23.5	350	–	13.5	100	85	85
		25							Passing	13.5	26.5	23.5	250	375	13.5	100	85	85
HB 12/2	12	35	36	71	1.8 ± 0.6	17.0	32.7 ± 0.55	BA 20d	Driving	13.5	38.5	31.5	520	–	13.5	100	85	85
		35							Passing	13.5	38.5	31.5	370	560	13.5	100	85	85
HB 24/1	24	45	36	71	2.2 ± 0.8	17.0	32.7 ± 0.55	BA 20d	Driving	28	49.5	40.5	665	–	28	100	85	85
		40							Passing	28	44.0	36.0	470	700	28	100	85	85

NOTES

1 Lamp HB 6/1 shall be phased out and hence is not intended to be used in new design after 30 March 1995.

2 All dimensions are in millimetres.

3 Ageing period at test voltage shall be 15 minutes.

(*Page* 12, *Table* 3C, *figure*) – Delete the values after '*f*' from the figure.

(*Page* 12, *Table* 3C, *figure*) – Substitute the following Table 3C for the existing table except for the figures:

Table 3C Head Light Lamps (Asymmetric Beam Pattern)

(*Clauses* 3.1 *and* 4.1.1)

Ref No.	**Volt**	**Watt**	**Diameter** *Max*	**Overall Length** *Max*	**Length Flange to Lug,** *Max*	**Light Centre Length**	**Dimension** *f*	**Cap**	**Filament**	**Initial Ratings of Lamps (Average of RTQ)**					**Life Test**		**Lumen**	
										Test Volts	Watt		Lumen		Test Volts	Specified Life (h)	Minimum Average of LTQ	Maintenance (%)
											Max	*Min*	*Min*	*Max*				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
HC 6/1	6	45/40	41	82	32	28.5 ± 0.55	0.8 ± 0.6	P 45t	Driving	6.0	49.5	40.5	600	-	6.75	75	63	85
									Passing	6.0	44.0	36.0	400	550	6.75	150	126	85
HC 12/1	12	45/40	41	82	32	28.5 ± 0.55	1.8 ± 0.6	P 45t	Driving	12	49.5	40.5	600	-	13.5	75	63	85
									Passing	12	44.0	36.0	400	550	13.5	150	126	85
HC 24/1	24	55/50	41	82	32	28.5 ± 0.55	2.2 ± 0.8	P 45t	Driving	24	60.5	49.5	600	-	28.0	75	63	85
									Passing	24	55.0	45.0	400	550	28.0	150	126	85

NOTES

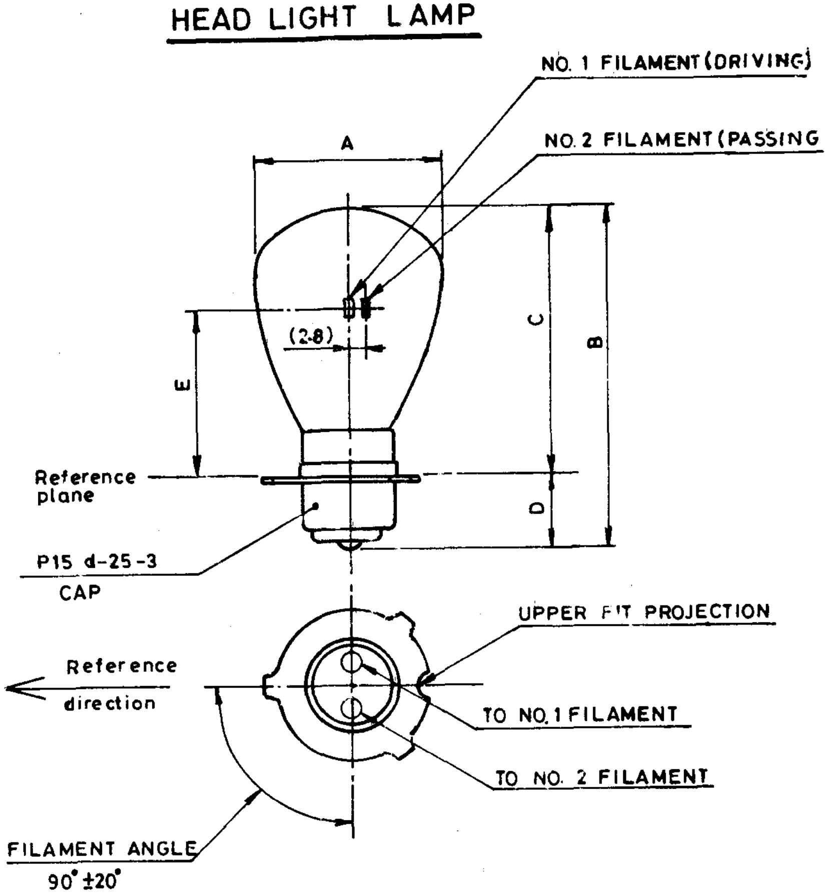
1 All dimensions are in millimetres.

2 Ageing period at test voltage shall be 30 minutes.

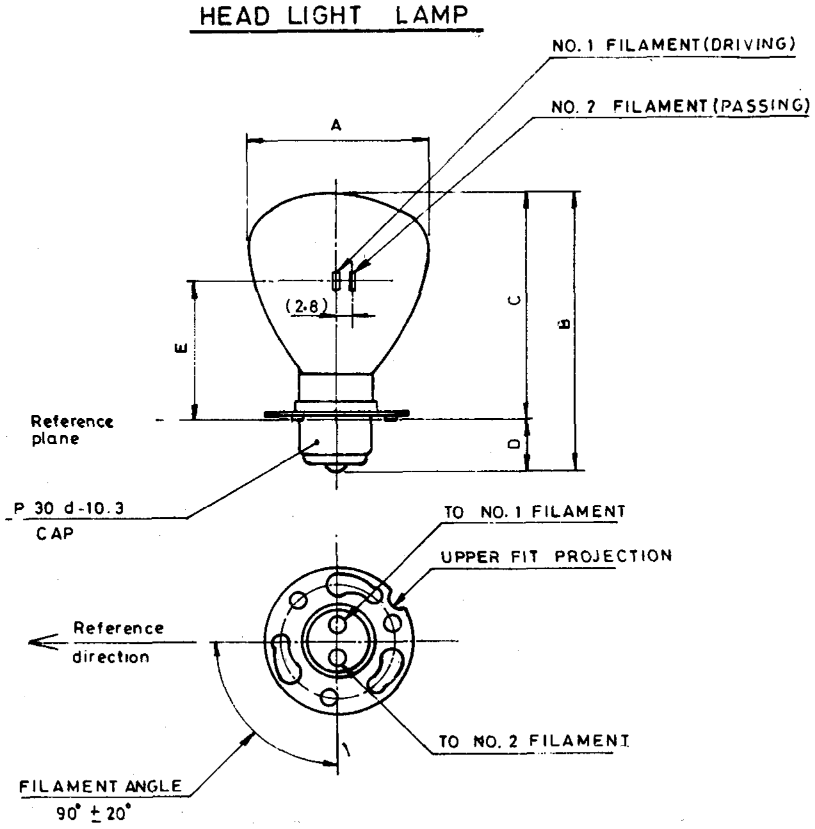
3 35 mm Oblong shape is also allowed.

(*Page* 12, *Table* 3C) – After Table 3C , insert the following new tables as Tables 3D and 3E :

Table 3D Head Light Lamps (Symmetric Beam Pattern)



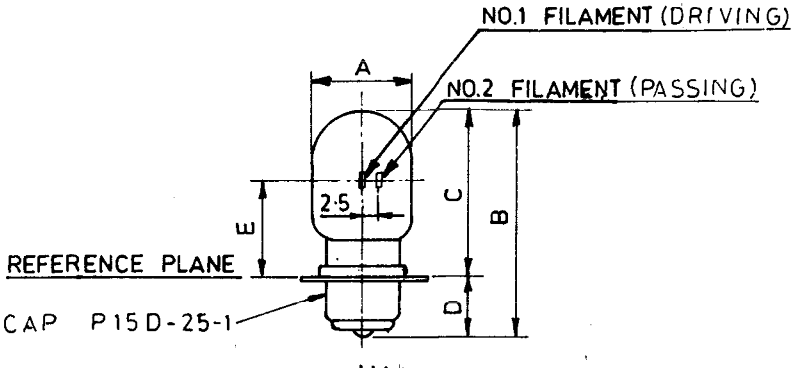
HJ 1



HJ 2

(*Continued*)

Table 3D Head Light Lamps (Symmetric Beam Pattern) - *Concluded*



HJ 3

Ref No.	Volt	Watt	Diameter *Max* A	Overall Length *Max* B	Length Pin to Solder *Max* D	Light Centre Length E	Cap	Ref to Fig.	Filament	Initial Ratings of Lamps (Average of RTQ)					Life Test		Lumen	
										Test Volts	Watt		Lumen		Test Volts	Specified Life (h)	Minimum Average of LTQ	Maintenance (%)
											Max	*Min*	*Min*	*Max*				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
HJ 6/1	6	25	31	60	12	28.5 ± 0.3	P15d – 25 – 3	HJ 1	Driving	6.5	27.5	22.5	350	–	6.50	100	85	70
		25							Passing	6.5	27.5	22.5	350	470	6.50	100	85	70
HJ 6/2	6	35	31	60	12	28.5 ± 0.3	P15d – 25 – 3	HJ 1	Driving	6.5	38.5	31.5	570	–	6.50	100	85	70
		35							Passing	6.5	38.5	31.5	570	720	6.50	100	85	70
HJ 6/3	6	25	36	60	12	28.5 ± 0.3	P30d – 10.3	HJ 2	Driving	6.5	27.5	22.5	370	–	6.50	100	85	70
		25							Passing	6.5	27.5	22.5	370	470	6.50	100	85	70
HJ 12/1	12	35	31	60	12	28.5 ± 0.3	P15d – 25 – 3	HJ 1	Driving	13.0	38.5	31.5	580	–	13.0	100	85	70
		35							Passing	13.0	38.5	31.5	580	750	13.0	100	85	70
HJ 12/2	12	25	20	50	12	20 ± 0.5	P15d – 25 – 1	HJ 3	Driving	13.0	27.5	23.7	360	–	13.0	100	85	70
		25							Passing	13.0	27.5	23.7	360	515	13.0	100	85	70
HJ 12/3		15	20	50	12	20 ± 0.5	P15d – 25 – 1	HJ 3	Driving	13.0	16.5	13.5	200	–	13.0	100	85	70
		15							Passing	13.0	16.5	13.5	200	260	13.0	100	85	70

NOTES

1 Lamps HJ 12/1 and HJ 12/3 shall be phased out and hence not intended for new design after 30 March 1995.
2 Ageing period at test voltage shall be 15 minutes.
3 All dimenstions are in millimetres.
4 For the purpose of clause **4.3**, the lumen maintenance (%) shall be verified at 75% of the specified life.

Table 3E Head Light Lamps (Asymmetric Beam Pattern Halogen)

(*Clauses* 3.1 *and* 4.1.1)

Ref No.	Volt	Watt	Diameter *Max*	Overall Length Max	Length Pin to Solder *Max*	Light Centre Length	Dimension *f*	Cap	Ref to Fig.	Filament	Initial Ratings of Lamps (Average of RTQ)					Life Test		Lumen	
											Test Volts	Watt		Lumen		Test Volts	Specified Life (h)	Minimum Average of LTQ	Maintenance (%)
												Max	*Min*	*Min*	*Max*				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
HE 12/1	12	60/55	–	92	32	28.5 + 0.55 – 0.45	1.7 + 0.5 – 0.3	P43t – 38	HE 1	Driving	12	75	–	1 000	1500	13.2	150	126	85
										Passing	12	68	–	600	900	13.2	300	252	85
HE 12/2	12	60/55	–	92	32	28.5 + 0.55 – 0.45	1.7 + 0.5 – 0.3	P45t – 41	HE 2	Driving	12	75	–	1000	1500	13.2	150	126	85
										Passing	12	68	–	600	900	13.2	300	252	85
HE 24/1	24	75/70	–	92	32	29.0 ± 0.60	2.0 ± 0.4	P43t – 38	HE 1	Driving	24	85	–	1000	1500	28.0	150	126	85
										Passing	24	81	–	640	960	28.0	300	252	85
HE 24/2	24	75/70	–	92	32	29.0 ± 0.60	2.0 ± 0.4	P45t – 41	HE 2	Driving	24	85	–	1000	1500	28.0	150	126	85
										Passing	24	81	–	640	960	28.0	300	252	85

NOTES

1 Halogen lamps shall be used only if the headlight assembly complies with IS 3563 : 1974 – Automobile Headlights.

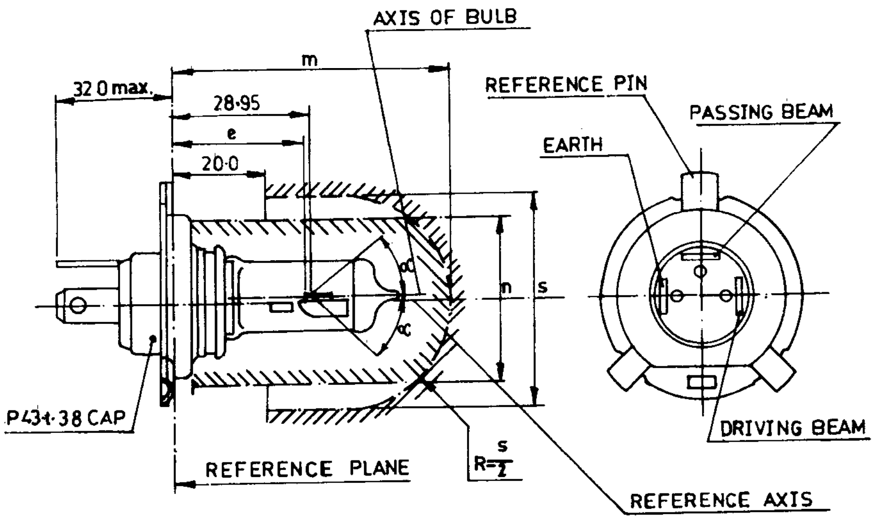
2 Halogen lamps other than these shall be treated as non-standard:

3 HE 12/2 and HE 24/2 shall be phased out and are not intended for use in new design of head lamps after 30 March 1995.

4 All dimensions are in millimetres.

5 Ageing period at test voltage shall be 30 minutes.

6 For the purpose of clause **4.3**, the lumen maintenace (%) shall be verified at 75% of the specified life.

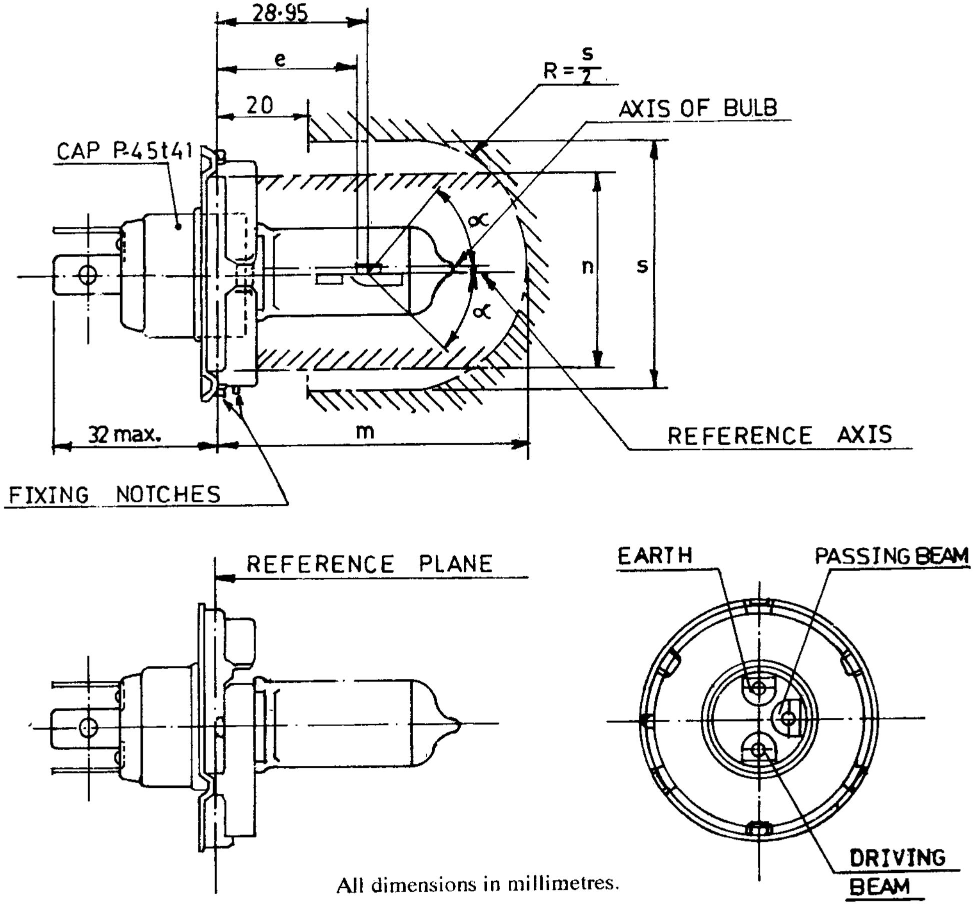


All dimensions in millimetres.

Reference	Dimension	Tolerance
e	28.5	+ 0.45 - 0.25
m	60.0 *Max*	—
n	34.5 *Max*	—
s	45.0	—
∝	40° *Max*	—

Halogen Lamp with P 43 t 38 Cap

HE 1



All dimensions in millimetres.

Reference	Dimension	Tolerance
e	28.5	+ 0.45 - 0.25
m	60.0 *Max*	—
n	34.5 *Max*	—
s	45	—
∝	40° *Max*	—

Halogen Lamp with P 45 t 41 Cap

HE 2

(*Page* 13, *Table* 4) – Substitute the following for the existing table except for the figures:

Table 4 Festoon Lamps

(*Clauses* 3.1 *and* 4.1.1)

Ref No.	**Volt**	**Watt**	**Diameter** *Max*	**Cap**	**Ref to Fig.**	**Initial Ratings of Lamps (Average of RTQ)**				**Life Test**		**Lumen**	
						Test Volts	Watt		Lumen	Test Volts	Specified Life (h)	Minimum Average of LTQ	Maintenance (%)
							Max	*Min*	*Min*				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
F 6/1	6	3	9	S 7	F_1	6.75	3.9	3.2	22	6.75	200	156	85
F 6/2	6	5	11	SV 8.5	F_2	6.75	5.5	4.5	36	6.75	200	156	85
F 6/3	6	10	15.5	SV 8.5	F_3	6.75	11	9	100	6.75	200	156	85
F 6/4	6	18	15.5	SV 8.5	F_3	6.75	19.8	16.2	200	6.75	200	156	85
F 12/1	12	3	9	S 7	F_1	13.5	3.9	3.2	24	13.5	200	156	85
F 12/2	12	5	11	SV 8.5	F_2	13.5	5.5	4.5	36	13.5	200	156	85
F 12/3	12	10	15.5	SV 8.5	F_3	13.5	11	9	100	13.5	200	156	85
F 12/4	12	18	15.5	SV 8.5	F_3	13.5	19.8	16.2	200	13.5	200	156	85
F 12/5	12	5	9	S 7	F_1	13.5	5.5	4.5	36	13.5	200	156	85
F 12/6	12	10	11	SV 8.5	F_2	13.5	11	9	100	13.5	200	156	85
F 12/7	12	15	15.5	SV 8.5	F_3	13.5	16.5	13.0	150	13.5	200	156	85
F 24/1	24	5	11	SV 8.5	F_2	28	7.7	6.3	36	28	200	256	85
F 24/2	24	18	15.5	SV 8.5	F_3	28	19.8	16.2	200	28	200	156	85

NOTES

1 Lamps F 12/1 shall be phased out and hence not intended for use in new design after 30 March 1995.

2 Maximum diameter of 12 mm is permissible in the place of 11 mm for lamps as for Fig. 2, if agreed by the supplier and the manufacturer.

3 All dimensions are in millimetres

4 Ageing period at test voltage shall be 15 minutes.

(*Page* 14, *Table* 5) – Substitute the following for the existing table:

Table 5 Lamps Used for Fog and Revolving Flashing Lights

(*Clauses* 3.1 *and* 4.1.1)

Ref No.	Volt	Watt	Diameter *Max*	Overall Length Max	Length Pin to Solder *Max*	Light Centre Length	Cap	Intial Ratings of Lamps (Average of RTQ)				Life Test		Lumen	
								Test Volts	Watt *Max*	Watt *Min*	Lumen *Min*	Test Volts	Specified Life (h)	Minimum Average of LTQ	Maintenance (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
F 01	12	35	36	66.5	16.5	30.0 ± 0.55	BA 20S	13.5	38.5	31.5	685	11.5	100	85	85
F 02	12	50	29	64.0	16.0	21.5 ± 0.55	P 36S	13.2	61.0	50.0	1150	14.0	75	63	85
F 03	24	36	36	58.2	7.5	31.8 ± 1.0	BA 15S	13.0	40.0	32.0	600	28.0	100	85	85

NOTES

1 All dimensions are in millimetres.

2 Ageing period at test voltage shall be 15 minutes.

(*Page* 16, *Table* 7) – Delete.

(*Page* 17, *Table* 8A) – Delete.

(*Page* 18, *Table* 8B) – Delete.

(*Page* 19, *Table* 8C) – Delete.

(*Page* 20, *Table* 9) – Delete.

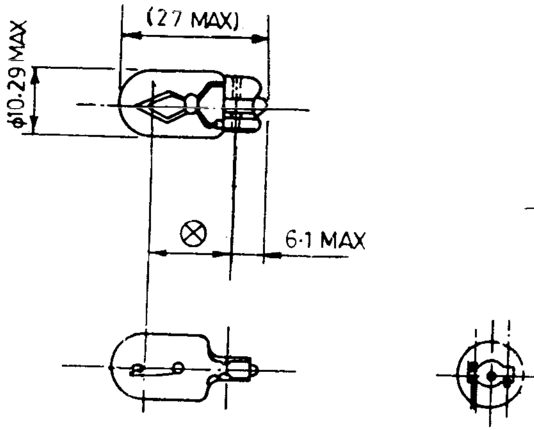
(*Page* 20, *Table* 10) – Delete.

(*Page* 15, *Table* 6) – Substitute the following for the existing table:

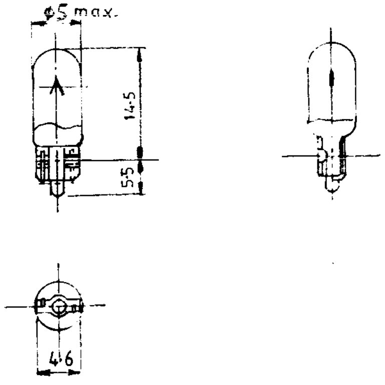
Table 6 Wedge Type Lamp

(*Clauses* 3.1, 4.2, 8.4 *and* 8.5)

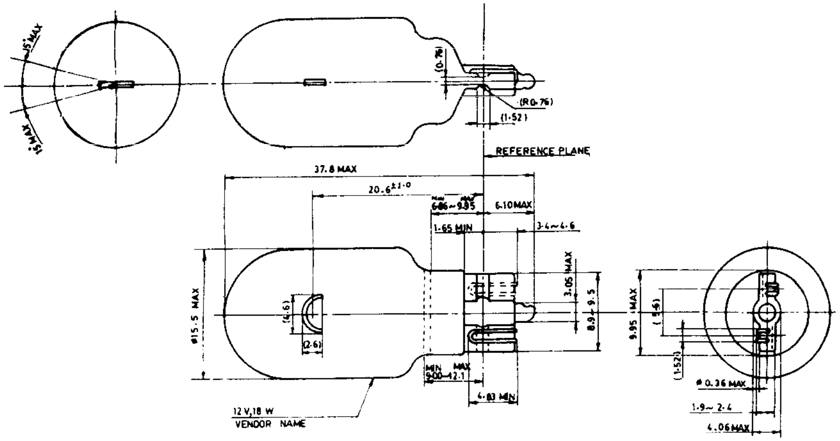
Ref No.	**Ratings**		**Ref to Fig. No.**	**Cap Size**	**Agings Period at Life Test Volts**	**Initial Ratings of Lamps (Average of RTQ)**				**Life Test**		**Lumen**	
	Volts	Watts				Test Volts	Watt		Lumen	Test Volts	Specified Life (h)	Minimum Average of LTQ	Maintenance (%)
							Max	*Min*	*Min*				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
W 12/1	12	1.2	W 2	W 2 x 4.6D	1/4	13.5	1.4	1.0	6	13.5	1000	850	85
W 12/2	12	1.7	W 1	W 2.1 x 9.5D	1/4	14.4	2.0	1.5	8	14.8	1000	850	85
W 12/3	12	3.0	W 1	W 2.1 x 9.5D	1/4	13.5	3.4	2.6	15	13.5	1000	850	85
W 12/4	12	5	W 1	W 2.1 x 9.5D	1/4	13.5	5.5	4.5	37	13.5	200	156	85
W 12/5	12	18	W 3	W 2.1 x 9.5D	1/4	12.8	19.8	17.2	150	12.8	200	156	85
W 24/1	24	1.2	W 2	W 2 x 4.6D	1/4	28	1.7	1.3	6	28	1000	850	85
W 24/2	24	3	W 1	W 2.1 x 9.5D	1/4	28	4.6	3.4	15	28	1000	850	85
W 24/3	24	5	W 1	W 2.1 x 9.5D	1/4	28	7.7	6.3	37	28	200	156	85



W 1



W 2



W 3

*Dimension 14.7 ± 2.3 for lamps W 12/3 and W 12/5 or 12.7 ± 1.5 for other lamps.

(*Page* 21, *clause* **4.2**, *line* 3) Delete the words '(*see* Tables 6 to 10)'.

(*Page* 21, *clause* **4.3**, *lines* 5 and 6) – Substitute the words '(*see* Table 6)' *for* '(*see* Tables 6 to 10)'.

(*Page* 22, *clause* **6.2**) – Substitute the following for the existing clause:

'**6.2 The Inspection Test Quality (ITQ)** – Inspection test quality shall be as under:

i) In the case of double filament lamps given in Table 3E and single filament lamps: 30

ii) In the case of other double filament lamps: 60.

(*Page* 22, *clause* **6.6**) – Delete.

(*Page* 23, *clause* **7.1.2**) – Add the following at the end:

'The lamps which fail during the ageing period shall be omitted from the test results.'

(*Page* 24, *clause* **7.4**, *para* 3) – Delete.

(*Page* 24, *clause* **7.4.1**) – Substitute the following for the existing clause:

'**7.4.1** *Voltage Control* – The measurements shall be carried out at the test voltage which shall be a stable ac voltage with frequency between 40 and 60 Hz. The test voltage is deemed to be stable when the momentary fluctuation does not exceed 1 percent and average over the period does not vary by more than + 0.1 V from the test voltage.'

(*Page* 24, *clause* **7.4.5**) – Insert the following new clause as clause **7.4.6**:

'**7.4.6** *Test Conditions* – During the life test, it is preferable to maintain the room temperature at 25 + 2.5°C. If this is not possible, adequate care should be taken that heat of one lamp does not disturb the other lamps. This condition shall be deemed to be satisfied if a minimum distance of 250 mm is kept between lamps.'

[*Page* 25, *clause* **8.4** (a) and (b)] – Delete the words '(*see* Tables 6 to 10)'at both the places,

(*Page* 25, *clause* **3.5**) – Renumber this clause as **8.5** and substitute the following for the existing clause:

'**8.5 Life Performance** – The batch shall be considered as complying with life performance requirements (*see* **4.3**), if:

a) The minimum average life of the LTQ shall not be less than the minimum life specified in the relevant tables.

NOTE – These figures are lower than the specified life in order to cover the statistical uncertainty involved in testing small samples.

b) The number of lamps of the LTQ having lives less than 60 percent of the specified life together with the lamps having lumen maintenance at 50 percent of the specified life less the value specified in the relevant table shall not exceed the compliance number given below:

Test Quantity	*Compliance*	*Number*
10	For Group I and IV	4
	For Other Groups	2

(*Page* 25, *clause* **A-1**) – Insert the following new clause as clause **A-2** :

'**A-2** In the case of caps BA 20d, BA 15, BAY 15, BA 9 and BA 7, the slot if provided for side solder of wire and soldering shall be such that the tolerance on diameter 'A' is maintained over the area covered by the dimensions 'N'.

(*Page* 27, *Article Sheet No.* 2) – Add the following Note at the end:

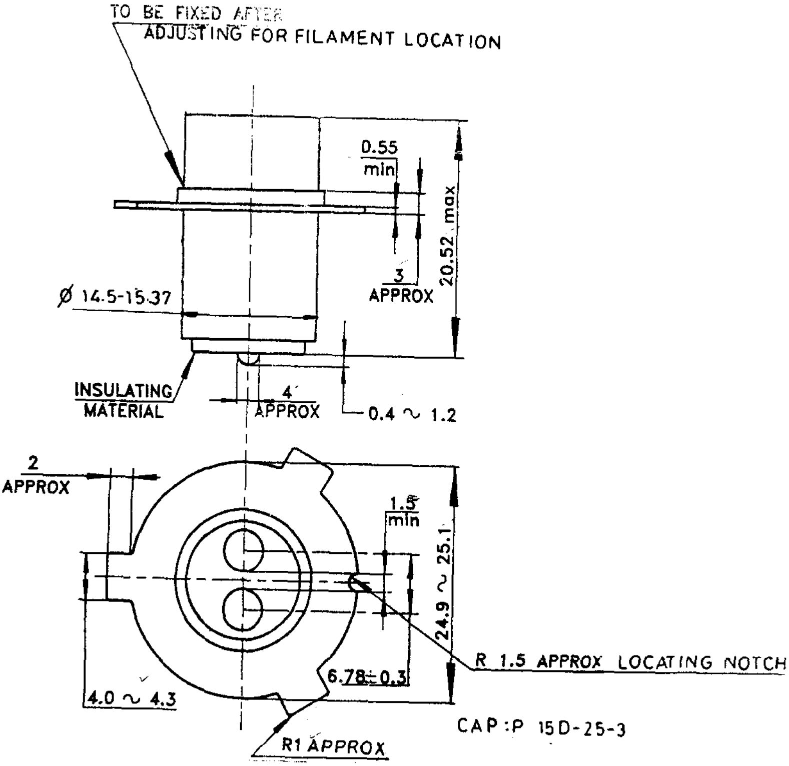
'NOTE – The maximum dimensions *P* and *D* for Caps on finished lamps can be permitted to be 11.2 and 6.2 respectively if agreed to between purchaser and supplier.'

(*Page* 31, *Article Sheet No.* 5, *figure*) – Substitute 'K1 for oval contacts K2 for round contacts' for the notation 'K'.

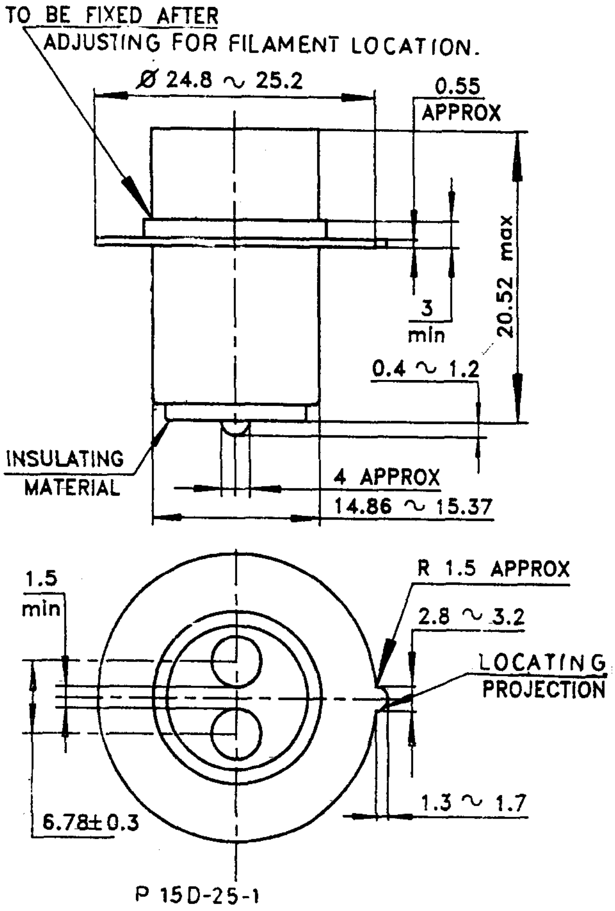
(*Page* 31, *Article Sheet No.* 5, *Figure*) – Substitute 'J1 for oval contacts J2 for round contacts' *for* the notation 'J'.

(*Page* 34, *Article Sheet No.* 7, *Internal Table*) – For dimension 'T' substitute '0.65' *for* '0.74'.

(*Page* 34, *Article Sheet No.* 7) – Insert the following Article Sheets Nos. 8, 9, 10 and 11.



ARTICLE SHEET NO. 8



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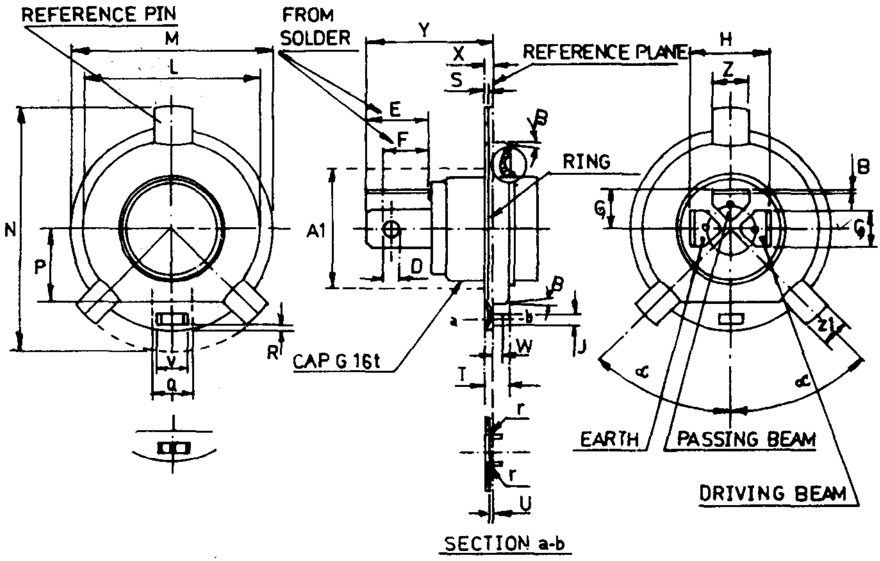
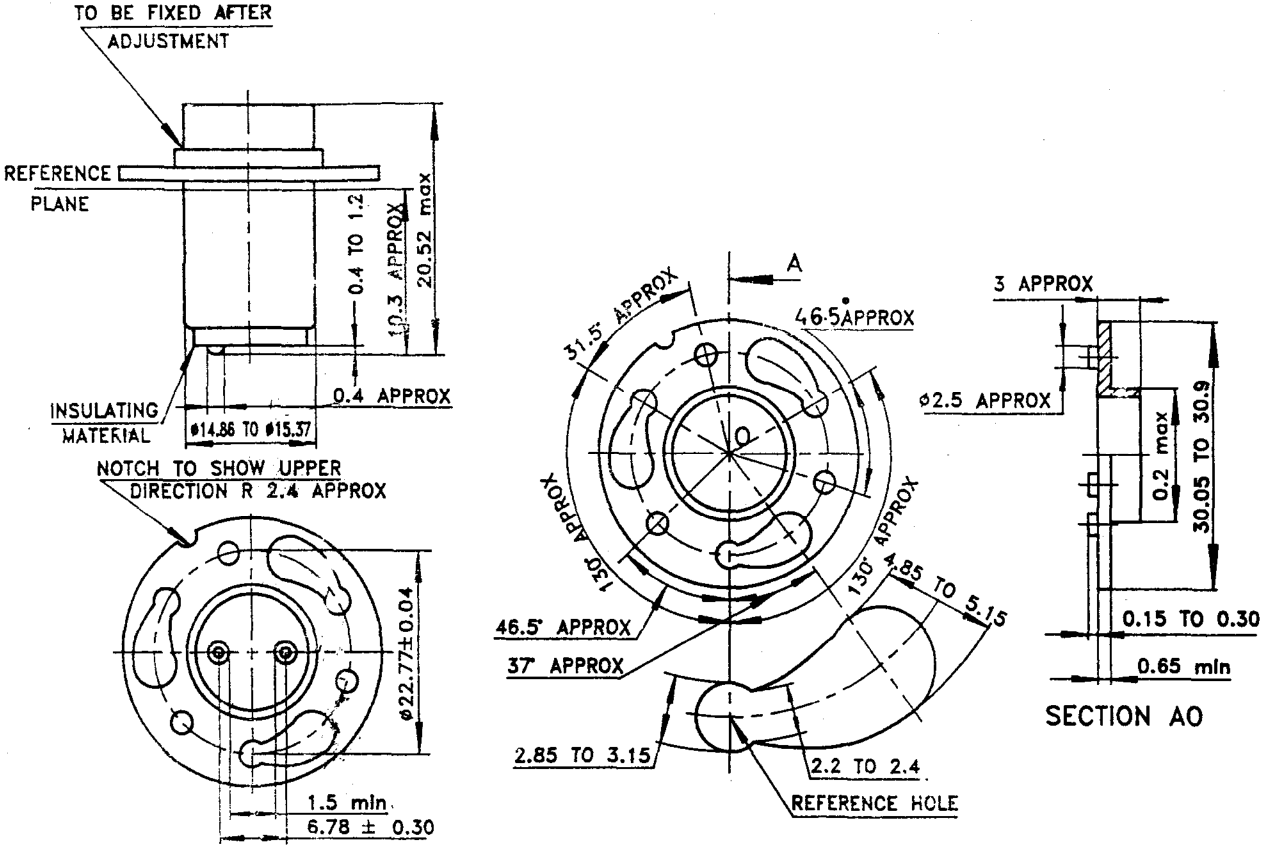


Dimension	Min.	Max.	Dimension	Min.	Max.
A1	25.0	—	*S*	0.5	—
B	0.7	0.8	*T*	5.0	6.0
C	7.7	8.1	*U*	—	*
D	3.0	33	*V*	6.3	6.5
E	11.8	13.6	*W*	1.8	2.2
F	8.8	10.3	*X*	1.1	1.3
G	8.5	9.0	*Y*		32.0
H	17.0	17.9	*Z*	7.9	8.0
J	1.9	2.1	*Z1*	5.8	6.2
L	37.8	38.0	*r*	—	*
M	42.8	43.0	α	44°	46°
N	51.6	52.0	β	—	5°
P	15.3	15.5			
Q	8.5	—			
R	1.3	1.7			

* Radius *r* must not exceed dimension *U*.

Cap P43t-38

ARTICLE SHEET NO. 10



CAP: P 30D-10-3

ARTICLE SHEET NO. 11

Printed at New India Printing Press, Khurja, India

AMENDMENT NO. 3 JUNE 1996
TO
IS 1606 : 1979 SPECIFICATION FOR AUTOMOBILE LAMPS

(Second Revision)

[*Page* 6, *clause* **3.1**, *line* 1 (*see also Amendment No.* 2)] — Substitute 'six' *for* 'seven'.

[*Page* 12, *Table* 3C, *col* 11, *all rows* (*see also Amendment No.* 2)] — Substitute '6.3 V' *for* '6.0', '13.2 V' *for* '12.0 V' and '28.0 V' *for* '24.0 V '.

[*Page* 12, *Table* 3E, *col* 12, *all rows* (*see also page* 10 *of Amendment No.* 2)] — Substitute '13.2 Volts' *for* '12.0 Volts' and '28.0 Volts' *for* '24.0 Volts'.

[*Page* 12, *Table* 3E, *col* 15, *Rows* 5 *and* 6 (*see also page* 10 *of Amendment No.* 2)] — Substitute '1900 lumen' *for* '1000 lumen' and '1000 lumen' *for* '640 lumen'.

[*Page* 12, *Table* 3E, *col* 7, *Table for dimension 'e' on light centre length of Ref No.* HE 12/1 (*see also Amendment No.* 2)] — Substitute:

'$28.5^{+0.45}_{-0.25}$' *for* '$28.5^{+0.55}_{-0.45}$'

[*Page* 12, *Table* 3E, *col* 7, *Table for dimension 'e' on light centre length of Ref No.* HE 24/1 (*see also Amendment No.* 2)] — Substitute:

'$28^{+0.45}_{-0.25}$' *for* '29.0 ± 0.60'

(*Page* 12, *Table* 3E, *col* 13, *Row* 6 (*see also Amendment No.* 2)] — Substitute '80' *for* '81'.

[*Page* 12, *Table* 3E, *col* 8, *dimension 'f', Rows* 1 *and* 3 (*see also Amendment No.* 2)] — Substitute:

'$1.7^{+0.7}_{-0.6}$' *for* '$1.7^{+0.5}_{-0.3}$' and '2.0 ± 0.7' *for* '2.0 ± 0.4'.

[*Page* 22, *clause* **6.2** (*see also Amendment No.* 2)] — Substitute 'Inspection test quantity' *for* 'Inspection test quality'.

(*Page* 22, *clause* **6.4**, *line* 3) — Substitute '20 lamps' *for* '10 lamps'.

(ETD 23)

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CORRIGENDUM OCTOBER 1996
TO
IS 1606 : 1979 SPECIFICATION FOR AUTOMOBILE LAMPS

(Second Revision)

[*Page* 12, *Table* 3C, *col* 8, *Row* 1 (*see also Amendment No.* 2)] — Substitute '1.8 ± 0.6' *for* '0.8 ± 0.6'.

(ETD 23)

Reprography Unit, BIS, New Delhi, India